

Bulletin of the Museum of Comparative Zoölogy

AT HARVARD COLLEGE.

VOL. LXIV. No. 3.

NEW NEUROPTEROID INSECTS.

BY NATHAN BANKS.

WITH SEVEN PLATES.

CAMBRIDGE, MASS., U. S. A.

PRINTED FOR THE MUSEUM.

OCTOBER, 1920.

No. 3.—*New Neuropteroid Insects.*

BY NATHAN BANKS.

IN the course of identifying the Neuropteroid insects in the Museum numerous new species were found; some of these are herewith described. In several cases Dr. Hagen had given manuscript names, and in a few cases these have been published, as the South American species in the appendix to his Synopsis of the Neuroptera of North America. Wherever possible I have retained his manuscript name.

PSOCIDAE.

PSOCUS ALBOVARIUS, sp. nov.

TYPE.—M. C. Z. 10,780. Straits Settlements: Singapore (C. F. Baker).

Head whitish, ocelli on a black spot, a dark median spot on vertex, and one below ocelli; nose faintly lineate with dark; antennae pale; thorax pale, with three large dark spots above in front; abdomen pale, darker at tip; legs whitish. Wings lightly fumose, except at base; stigma white, with a dark central spot; veins dark, stigmal vein white, veins at corners of the discal cell, the lower side of cell, the median vein shortly before cell and just beyond cell, and the forking of the radial sector prominently white; hind wings hyaline, venation pale. Discal cell much narrowed below, sides nearly straight; areola postica very long and low, its upper side a little longer than the outer side; posterior cells subequal; fork of radial sector more than twice as long as the pedicel; median vein and radial sector united for short distance; stigma of medium size, about its length before tip of wing, nearly right-angled behind.

Length to tip of wing 3.6 mm.

PSOCUS SIMILARIS, sp. nov.

TYPE.—M. C. Z. 10,779. Straits Settlements: Singapore (C. F. Baker).

Head brown, with a few small black spots and lines, one back of the ocelli; nose lined with black; antennae brown on basal part, beyond black, with some long hairs; thorax pale, a large black spot on each lateral lobe, and two spots on the anterior lobe; legs pale, tibiae and tarsi darker, abdomen dark, a white

band above near tip. Wings hyaline; apical half of stigma dark, and also a little at base, and pale just before the dark; a small dark spot at end of anal vein. Veins dark, the forking of radial sector and lower side of discal cell pale. Stigma of moderate size and height, almost right-angled behind; radial sector and the median vein meet at one point; fork of radial sector twice as long as the pedicel; areola postica about as high as long, rather narrow above; discal cell one and a fourth longer than broad, slightly narrowed below, sides nearly straight; posterior cells subequal.

Length to tip of wings 3.2 mm.

PSOCUS PULCHELLUS, sp. nov.

TYPE.—M. C. Z. 10,796. Straits Settlements: Singapore (C. F. Baker).

Head pale, with a few faint marks, antennae pale, darker toward tip and there the bases of the joints pale; thoracic lobes black, the middle one with two spots; legs pale, tips of tarsi dark. Fore wings white, heavily maculate with dark brown or black (Plate 2, fig. 17). The posterior cells almost wholly dark, a broad oblique band from before end of anal vein up toward stigma, but extending only a little above the median vein; base of stigma, and a mark below, apex of stigma, two large, and several small spots in radial fork, and several spots in area above median vein, and two spots in discal cell, one covering the lower part, are dark brown; veins white, heavily dotted with dark. Hind wings hyaline, veins white. Discal cell much longer than broad, scarcely narrowed below, outer side concave; fork of radial sector four times as long as pedicel; stigma low, and rounded behind; areola postica broad and low, pointed above.

Length to tip of wings, female 6 mm., male 5 mm.

PSOCUS HERMOSUS, sp. nov.

TYPE.—M. C. Z. 10,784. Straits Settlements: Island of Penang, Singapore (C. F. Baker).

Head pale, a few spots on the nose, antennae pale, beyond third joint darker at tips of joints; legs pale, base and tips of tarsi dark, lobes of thorax with dark spots. Wings hyaline, densely marked with small irregular brown patches, in the posterior cells occupying most of surface, along anal area the spots are in transverse rows, also in rows across the stigma and crossing veins behind and beyond it, several clouds in the discal cell and near by, tips of veins marked with darker spots, also one at base of stigma, and a long curved black mark behind the forking of radial sector. Veins pale, interrupted with dark;

discal cell longer than broad, outer side concave; areola postica long and low, pointed above; fork of radial sector about four times as long as pedicel; stigma moderately long, low, rounded behind; the stigma is usually rather yellowish; radial sector and median vein unite for a short distance.

Length 6 mm.

Two males from Sandakan, Borneo, probably belong to this species.

Psocus gloriosus, sp. nov.

TYPE.—M. C. Z. 10,795. Borneo: Sandakan (C. F. Baker).

Head pale, several dark spots above each eye, nose mostly dark; antennae pale on basal part, darker beyond; legs pale, tips of tarsi dark, thoracic notum mostly black, but pale across the front. Wings yellowish and whitish, yellowish mostly around the margin, and whitish on the disk; heavily marked with dark, but not irrorate, brown over most of posterior cells, and lower half of discal cell, a few pale spots left in the posterior cells; the brown margin extended around to tip of stigma; stigma yellowish, a black spot at base, anal region mostly black, the apical part extending upward a short distance, the dark mark broken by a narrow oblique pale streak and a few small pale spots, veins in this area dark, with some pale dots; the other venation pale yellowish, tips of veins black-spotted; the radial sector before it forks and slightly beyond black, and black spots along radius and inner side of discal cell; a prominent curved black spot behind the forking of radial sector and extending somewhat toward base of stigma. Venation as *P. pulchellus* and *P. hermosus*.

Length to tip of wings 6 mm.

Psocus luteolus, sp. nov.

TYPE.—M. C. Z. 10,793. Straits Settlements: Singapore (C. F. Baker).

Head pale, a subtriangular black mark from near ocelli down over the nose; antennae pale on basal part, joints 3, 4, and 5 with very distinct black band at tip, beyond joints mostly dark, with a narrow basal pale annulus; lobes of thorax dark; legs pale, tips of tarsi dark, wings densely conspersely marked with pale brown, much as in *Myopsocus lorlai*, but more broken up, and extending over entire surface except basal costal space, stigma also marked; four distinct black marks, one at apex of stigma, one below base of stigma, one behind fork of radial sector, and the other at end of anal vein. Venation rather yellowish, broken by pale brown spots. Venation about as in *P. hermosus* and *P. pulchellus*.

Length to tip of wing 6 mm.

PSOCUS VISCAYANUS, sp. nov.

TYPE.—M. C. Z. 10,797. Philippines—Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Head pale yellowish brown, with a median blackish stripe half way down on the nose; antennae black, pale on most of the third joint, in male with moderately long hair; thorax with three black spots in front; abdomen dark brown; legs pale, the tibiae and part of tarsi dark. Wings hyaline, with black marks much as in *P. feai*, but the median band is broad reaching from hind border obliquely upward, the stigmal and apical streak as in that species, base of stigma pale. The radial sector and median unite for a short distance, fork of radial sector nearly three times as long as the pedicel, discal cell much longer than broad, the stigma rather short, almost acute behind.

Length to tip of wings, male 5 mm., female 6 mm.

PSOCUS BORNEENSIS, sp. nov.

TYPE.—M. C. Z. 10,791. Borneo: Sandakan (C. F. Baker).

Head pale, dark on nose; antennae pale brown to nearly black at tip, in male with extremely long hairs; femora pale, tibiae and tarsi dark; lobes of thorax blackish. Wings in general similar to *P. lemniscatus*, but the markings reduced so that only the stigma, a connecting spot between the lower branch of the radial sector and the median vein, and an oblique mark before end of the anal vein, remain; several of the apical veins are narrowly margined with dark; in the female the marks are more extensive, and mark below stigma over first posterior cell and out to tip is more or less definite. Venation dark, fork of radial sector and end of discal cell pale, in the female more veins pale, and with some dark streaks. The wings are shorter and proportionally broader than in *P. lemniscatus*, the posterior cells nearly subequal, the areola postica acute above. It differs chiefly in the stigma which is very much higher, and shorter than in *P. lemniscatus*.

Length, female 6 mm., male 5 mm.

PSOCUS RELATIVUS, sp. nov.

TYPE.—M. C. Z. 10,792. Straits Settlements: Singapore (C. F. Baker).

Related to *P. lemniscatus* and *P. borneensis*, but with a reduced pattern of markings. In the fore wings the stigma is dark only across the tip; all the veins beyond the middle of the wings are plainly margined with dark, a con-

necting spot between lower branch of radial fork and the median vein, two transverse spots on the hind margin, one at the end of the anal vein, the other some distance before it, and a small mark on the median vein some distance before the discal cell; venation dark, fork of radial sector and lower side of the discal cell pale. The stigma is rather shorter and higher than in *P. lemniscatus*, but not as high as in *P. borneensis*, and is right-angled behind. The discal cell is much longer than broad, narrowed below; the posterior cells subequal, the areola postica broad above, and the fork of radial sector about twice as long as the pedicel.

Length of female to tip of wings 5 mm.

PSOCUS PARISHI, nov. sp.

TYPE.—M. C. Z. 10,805. Peru: Lima, 21–31 August; Chosica, 7 July (H. S. Parish).

Pale, marked with brown; vertex with a median brown spot behind; face with three small dark spots, nose faintly lineate, the dark forming a large spot below; antennae dark, second joint pale; hairs moderately short; legs pale, femur dark just before the tip; thorax with the usual lobes dark, the median lobe traversed by a pale median line; abdomen brown. Wings hyaline; stigma dark, its bordering veins pale, other veins mostly dark, the discal cell white at lower angle and the lower part of outer side, and the fork of radial sector white as usual, and moreover all of the apical branches are white in the middle parts of their length, and very plainly dark and dark bordered at ends. There are small dark clouds in many of the cells, and larger marks at the anal angle and just before the discal cell. The stigma is fully twice as long as broad, hardly angulate behind. The discal cell touches the radial sector at one point, its outer side concave.

Length 3.5 mm.

PSOCUS AZTECANUS, nov. sp.

TYPE.—M. C. Z. 10,802. Peru: Lima, 12–30 August (H. S. Parish).

Pale, marked with brown; nose densely lineate, vertex with a median dark stripe reaching to the ocelli, and a dark spot each side near the eye; antennae dark, short-haired; thorax brown, the sutures pale; abdomen brown; legs pale, the tarsi rather darker; wings hyaline, stigma dark, pale at the base, veins brown, the lower part of the discal cell, and the forking of the radial sector whitish hyaline; a small dark spot at the end of the anal vein; discal cell long and narrow, its basal side convex, connected to the radial sector by a

long pedicel; stigma slightly rounded behind, its outer side about one half the length of its inner side. Front tarsus with first joint a little longer than the second, in hind tarsus first joint more than twice the second.

Length 4 mm.

PSOCUS MEMORIALIS, nov. sp.

TYPE.—M. C. Z. 10,804. Colombia: Caldras, 4,400 ft. (H. Fassl).

Pale, marked with brown; nose lineate, vertex shining brown in the middle; antennae dark, finely short-haired; thorax shining brown, the sutures pale; abdomen brown; legs pale, tarsi darker. Wings hardly clear, veins brown, stigma brown, and a brown spot at the anal angle, lower side of the discal cell and the forking of the radial sector whitish hyaline; stigma long, rounded behind; discal cell touching the radial sector at one point or for a short distance, the cell much longer than broad, and narrowed below, inner side plainly convex. The wings are rather more slender than usual. In front tarsus first joint is as long as second, in hind tarsus first joint is about twice as long as the second.

Length 4 mm.

PSOCUS LEPIDUS, sp. nov.

TYPE.—M. C. Z. 10,810. Brazil (Winthem coll.).

Head pale yellowish; a black stripe each side from eyes to mouth, nose with a large, median blackish stripe, clypeus black; vertex and front with a large median dark spot extending each side on vertex in a rounded spot, and each side of vertex extending down obliquely toward base of antennae; antennae very fine, pale, beyond third joint darker, with few fine hairs; palpi black, except most of basal joint; thorax shining blackish, pale on sutures; lower part of pleura black; legs mostly black, basal part of femora and a band before tip pale, tibia with subbasal and preapical pale bands, and most of first tarsal joint pale; front tarsus has first joint fully twice as long as second joint, in hind tarsus the first joint fully four times as long as the second. Abdomen dark, some pale spots on sides and on venter. Wings hyaline; stigma angulate behind, inner side concave, outer side convex, stigma hardly its length from tip of wing; radial sector forks just before the angle of stigma, the pedicel more than one half as long as fork; discal cell connected to radial sector by a short pedicel, inner side convex, outer straight; first and second posterior cells about equal at base, and longer than the areola postica. Veins dark, forking of radial sector, lower outer and lower inner angle of discal cell, and the connecting veinlet to hind margin are whitish hyaline; stigma dark, basal part, except extreme base, yellowish; a dark mark extends the angle of stigma nearly to the next vein; distinct spot at end of anal vein, and several veins near cell margined with black.

Length 7 mm.

Psocus sticticus, sp. nov.

TYPE.—M. C. Z. 10,811. Brazil (Winthem coll.).

Pale brown; a reddish brown mark across vertex, and each side obliquely up from the cheeks through the base of the antennae to the ocelli, lower part of nose reddish brown, clypeus blackish; thorax dark, with pale on sutures; abdomen red-brown; legs pale, tips of tibiae and last tarsal joints dark. Wings hyaline, with large brown marks (Plate 1, fig. 1); an oblique band from base of stigma backward, and a median longitudinal stripe, extending down the veins, covering second posterior cell, and an extension upward through the apical part of the stigma, basal part of stigma yellowish. Stigma more than its length from wing-tip, almost angulate behind, radial sector forks much before angle of stigma, first posterior cell hardly broader at base than the areola postica. Veins dark; basal part of stigmal vein yellowish; the fork of radial sector margined with pale, the basal side of discal cell pale in middle of length, the basal part of outer vein, and the connection to the hind margin whitish hyaline; the radius and median vein mostly pale on basal parts. Antennae pale, darker from middle of third joint, very slender, with very short, fine hair, the third joint about as long as width of wing. In front tarsus the first and second joints subequal, in hind tarsus the first joint more than twice as long as the second.

Length 7.5 mm.

Psocus quadrisignatus, sp. nov.

TYPE.—M. C. Z. 10,814. Brazil (Winthem coll.).

Pale yellowish; a brown stripe on head from ocelli down over the nose; thoracic notum has dark spots on the lobes; abdomen black at base, beyond with some dark spots; legs pale, tarsi not or barely darker; antennae pale, beyond middle of third joint darker, densely clothed with long hairs. Wings hyaline, veins mostly pale, the forks of median toward tip are darker; two large brown spots on each fore wing, a rounded one in stigma, and a subtriangular one just before basal angle of discal cell. Stigma hardly its length from wing-tip, rounded behind; radial sector forks just before bend of stigma; discal cell much longer than broad, much narrowed below, outer side concave; first and second posterior cells about equal above on median vein (Plate 3, fig. 34). In front tarsus the first joint is twice as long as the last; in hind tarsus the first joint nearly four times as long as the last.

Length 4 mm.

Psocus coquilletti, sp. nov.

TYPE.—M. C. Z. 10,813. Calif.: Los Angeles (Coquillett coll.).

Brown; a curved pale mark just inward of eyes, and near bases of antennae, antennae pale, tips of joints darker, with fine, very short hairs, third joint not

more than one half of width of wing; thorax dark brown, sutures pale; abdomen brown; legs pale, tips of tibiae and last tarsal joints dark, in front tarsi the basal joint longer than apical, in hind tarsi the basal joint two and a half times longer than apical joint. Wings hyaline whitish, marked with black (Plate 1, fig. 7), two spots in stigma, three in discal cell, a broad streak from fork of radial sector out to tip of wing, and several veins margined with dark; the anal region mostly dark, and clouds in several cells near middle of wing. Veins black, stigmal vein pale, stigma almost angulate behind; discal cell very slender, outer side a little concave; first posterior cell very narrow, shorter on median vein than the areola postica.

Length 3 mm.

PSOCUS INTERRUPTUS, sp. nov.

TYPE.—M. C. Z. 10,807. Florida: Lake Worth (Mrs. A. T. Slosson).

Dark shining brown; antennae brownish, first joint more red-brown, with very short, fine hair, third joint about as long as one half the width of the wing; thorax with sutures pale; legs pale, tarsi rather darker, basal joint of front tarsus barely longer than the apical joint. Wings hyaline, with two large dark spots which together form an interrupted fascia; one of the spots on the stigma, and the other over the first posterior cell and a little inward from it; a smaller spot at end of the anal vein (Plate 2, fig. 15). Stigma about its length from the wing-tip, rounded behind; radial sector forks behind bend of stigma, the pedicel very long; discal cell long, much narrowed below, short petiolate to the radial sector, inner side strongly convex; first posterior cell on median vein shorter than the second; veins pale brown; end of discal cell and fork of radial sector hyaline.

Length 3.4 mm.

SYNGONOSOMA REDUCTA, sp. nov.

Type.—M. C. Z. 10,806. Mexico: Orizaba (D. L. Crawford).

♂. Similar to *S. flagellicorne*, the antennae the same except that the hair on third joints is a little shorter. It differs from that species in the reduced extent of yellow on the veins, the fork of radial sector being yellow only at base, and no yellow on the forks of the median vein, and the inner side of discal cell darker; the stigma is hardly darker than rest of wing, and is rounded behind, and longer than in *S. flagellicorne*; the head is also darker; the areola postica is petiolate as in that species.

Length 7 mm.

A female from Orosi, Costa Rica, is much larger (10 mm. long); the stigma is more yellowish; the areola postica not petiolate, but otherwise agrees.

DINOPSOCUS, gen. nov.

In general similar to *Sigmatoneura*, but the third joint of the antennae is plainly thickened, especially toward tip, and densely hairy. The discal cell is closed; the median vein united to radial sector or connected by a cross-vein; stigma long and slender; areola postica short or broad above, but not pedicellate.

TYPE.—*D. atratus*, sp. nov.

This genus is much like our American *Cerastipsocus*, but differs in the antennae; it is also near *Syngonosoma*, which has the fourth joint of antennae also thickened.

DINOPSOCUS ATRATUS, sp. nov.

TYPE.—M. C. Z. 10,800. Borneo: Sandakan. Philippines — Mt. Banahao (C. F. Baker).

Blackish; a pale stripe through pleura and on sides of the abdomen, femora. pale at base; wings blackish, stigma and space behind it deeper black; venation dark, lower branch of fork of radial sector, lower end of discal cell, median vein from discal cell out to near tip, and the bases of the branches of median vein, are pale yellowish, in one specimen the upper and outer sides of discal cell are also rather pale. Antennae long, third joint subclavate, densely haired, fourth joint and beyond very slender, with few short hairs. Wings elongate; stigma long and slender, rounded behind, fork of radial sector broad at base, and nearly three times as long as pedicel; discal cell long and slender, sides nearly straight; areola postica high, fairly broad above; hind wings evenly blackish; hind tibiae slightly flattened.

Length 8.5 to 9 mm.

A broken female from Singapore is probably the same species.

DINOPSOCUS SEMICOLORATUS, sp. nov.

TYPE.—M. C. Z. 10,801. Philippines — Luzon: Makiling (C. F. Baker).

Blackish, antennae and palpi deep black. Wings hyaline, a large black mark over more than the basal third connected along costal area with a large black mark over stigma and beyond and with an extension toward the areola postica, and the apical part extended down over the third and a little of second posterior cell. Stigma moderately long, not very high, almost rounded behind, fork of radial sector about twice as long as the pedicel, not widened at base,

areola postica high, narrow above, discal cell longer than broad, inner side slightly convex; veins black, fork of radial sector pale at one point. Antennae long, third joint slightly curved, subclavate, with long black hair, but not as dense as in *D. atratus*, fourth joint slender, with moderately long hair.

Length to tip of wing 7.5 mm.

PODOPTEROCUS, gen. nov.

Venation as in *Psocus*; median and radial sector connected by a cross-vein, stigma long and slender; wings long and slender, without hairs. Antennae very long, the third joint somewhat thickened, especially in middle, densely hairy, fourth and fifth joints very long and tenuous, beyond the antenna is broken up into a great number of short fusiform joints. The hind tibia bears a wing-like expansion on each side (Plate 1, fig. 4).

TYPE.—*P. longicornis*, sp. nov.

PODOPTEROCUS LONGICORNIS, sp. nov.

TYPE.—M. C. Z. 10,785. Straits Settlements: Singapore (C. F. Baker).

Brown, few, if any, markings; antennae brown, third joint with black hair; legs brown, femora darker at tips. Wings faintly brown, base black for short distance out, stigma black, as also an area behind it, the margin beyond stigma also blackish. Veins mostly brown; discal cell nearly twice as long as broad, scarcely narrowed below, outer side rather concave; stigma very low and slender; fork of radial sector fully twice as long as the pedicel; areola postica as high as long, moderately broad above. Expansion of hind tibia on lower side broadest near base, on upper side broadest beyond the middle.

Length to tip of wings 6.5 mm.

GRAPHOPSOCUS SUBAEQUALIS, sp. nov.

TYPE.—M. C. Z. 10,790. Straits Settlements: Singapore (C. F. Baker).

Pale; a dark mark over ocelli, reaching each side to eye; lobes of thorax with shining black spots; legs pale; wings hyaline, veins dark, nearly black; stigma unmarked. Wings and venation about as in *G. infirmus*; it differs in having the fork of the radial sector about equal in length to the pedicel, and the areola postica is large, longer than high, and very short pedicellate; stigma shaped as in other species, and the connecting veinlet behind stigma ends about opposite the second branch of the median vein.

Length to tip of wings 4 mm.

GRAPHOPSOCUS INFIRMUS, sp. nov.

TYPE.—M. C. Z. 10,789. Philippines — Luzon: Nueva Vizcaya; Imugin. Benguet; Baguio.

Pale yellowish, a black mark over ocelli, extending each side to eye; antennae pale on base, beyond third joint dark, antennae of male not as heavy as in *G. uniformis*; each lobe of thorax with a polished dark spot. Wings whitish hyaline, whitish on basal part, and here the veins are largely hyaline, beyond the veins are dark and almost margined with dark; stigma not marked; a small dark spot at end of anal vein. Wings not as slender as in *G. uniformis*, venation similar; areola postica scarcely longer than high, long pedicellate; stigma shaped as in *G. uniformis*, the cross-vein behind ends just before second branch of median vein; the fork of radial sector not more than two thirds as long as the pedicel. Female similar, but the antennae paler, and more slender.

Length to tip of wing 4 mm.

GRAPHOPSOCUS UNIFORMIS var. FRONTALIS, var. nov.

TYPE.—M. C. Z. 10,788. Philippines — Luzon: Nueva Vizcaya; Imugin. Benguet; Baguio (C. F. Baker). Ceylon (Nietner).

Differs from the typical form in having a large black mark across face, usually connected to black around and back of the eyes. The radial sector is much darker than the other veins, and the stigma is more yellow than in *G. uniformis*. One specimen has a large black spot on radius a little before the stigma.

This is what Hagen recorded as a variety of the female. I have, however, both sexes from the Philippines.

EPIPSOCUS PICTUS, sp. nov.

TYPE.—M. C. Z. 10,812. Brazil (Winthem coll.).

Pale yellow; head with a median black stripe from ocelli down over nose and clypeus, broader below than above; on vertex is a pair of submedian brown stripes, connected at ends, and each side from the ocelli extends a brown mark to the lower edge of the eyes; lobes of thorax with brown marks; legs yellowish, tarsi slightly darker; the abdomen black above, mostly pale beneath. Wings hyaline, veins yellowish brown, partly pale; the marginal vein mostly brown; faint brown marks at end and beginning of stigma, and over ends of apical veins, and more faintly between them, a spot at anal angle; the stigma is more flattened behind, and the areola posterior more flattened above than in *E. nepos*; several of the veins are more sinuate than in that species.

Length 4.5 mm.

EPIPSOCUS FUMIPENNIS, sp. nov.

TYPE.—M. C. Z. 10,799. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Brown; antennae and legs paler. Wings of a nearly uniform brown tint, tips of veins with blackish spots; hind wings nearly hyaline. In general very similar to *E. delicatus* and *E. completus*; areola postica as long as stigma, its upper side nearly straight for some distance; the stigma long, and slender, its posterior side evenly rounded; the median vein and radial sector united by a long cross-vein; the fork of radial sector is plainly longer than its pedicel; the first branch of the median vein arises before the fork of the radial sector; basal joint of hind tarsus hardly as long as the stigma.

Length 4 mm.

Differs from *E. delicatus* and *E. completus* in the uniformly colored wings, and the very long fork of the radial sector.

EPIPSOCUS HYALINUS, sp. nov.

TYPE.—M. C. Z. 10,798. Straits Settlements: Singapore (C. F. Baker).

Brownish; black spot across upper part of nose, below pale, head white-haired; antennae and legs pale. Wings hyaline; vein pale brown, minute dark dots at ends of most of veins, and one on costa some distance before the stigma. Wings about as broad as in *E. delicatus*, not slender; stigma moderately long, evenly rounded behind; areola postica much shorter than stigma, twice as long as high; median vein and radial sector joined by a long cross-vein; fork of radial sector very short, hardly one half as long as pedicel, base opposite origin of second branch of the median vein, first branch of median vein arises beyond middle of areola postica; first joint of hind tarsus about as long as stigma.

Length to tip of wings 3.7 mm.

CAECILIUS REDUCTUS, sp. nov.

TYPE.—M. C. Z. 10,787. Philippines — Luzon: Mt. Makiling (C. F. Baker).

Head dark brown, thorax and abdomen paler brown; legs pale, tarsi dark, basal joint of antennae pale, beyond darker; eyes of male moderately large, about their diameter apart. Wings hyaline, with a broad dark streak through the middle to tip, leaving a pale space in front as broad, and a pale area behind

still broader; anal area with an elongate dark spot; a pale spot in tip of the dark stripe; the upper branch of fork of radial sector margined with dark. Wings rather slender, broadly rounded at tip; stigma slender, rounded behind; areola postica very small, semicircular; fork of radial sector about as long as the pedicel; first branch of median vein oppose base of fork of radial sector. Veins pale in pale areas, dark in dark spaces; hind wings hyaline, veins pale.

Length 3 mm.

CAECILIUS CINCTICORNIS, sp. nov.

TYPE.—M. C. Z. 10,782. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Pale yellowish brown. Head polished, a median round black spot on the nose; antennae pale, a rather broad black band at tip of each joint; thoracic lobes each with a large polished black spot; abdomen dark, a median pale stripe above; legs pale, tips of tarsi dark. Wings yellowish to brownish fumose, darkest in posterior cells, mostly yellowish on base, stigma yellowish, pubescent; veins mostly pale yellowish, but beyond middle mostly dark. Hind wings hyaline, yellowish on the costal base, veins pale. Wings long, stigma slender, but slightly angled behind; areola postica very small, and not twice as long as high; fork of radial sector as long as pedicel, and its base opposite first branch of the median vein.

Length to tip of wing 5 mm.

CAECILIUS PRETIOSUS, sp. nov.

TYPE.—M. C. Z. 10,809. Texas: San Antonio. D. C.: Washington (in greenhouse).

Pale yellowish, lobes of thoracic notum brownish. Wings hyaline, a faint cloud over stigma reaching somewhat behind, and another cloud over the areola postica reaching inward; a faint mark at end of anal vein. Veins mostly very pale, the radial sector and the median veins before they meet are heavily dark, forming a very distinct V-mark; the branches of median vein more or less dark. The stigma is very long, as long as in *C. aurantiacus*, the areola postica short and much lower than in *C. aurantiacus*, the end of the areola postica is opposite that of the stigma, so that the median vein forks far out, and its branches are very short and close together; the radial sector forks scarcely before end of the stigma.

Length 3 mm.

CAECILIUS DECEPTOR, sp. nov.

TYPE.—M. C. Z. 10,781. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Marked on the plan of *C. muggenburgi*, *C. dolobratus* and the species of *Dypsocus*. Head brown; antennae black, except the basal joints which are reddish; head flattened, finely short haired; femora yellowish, tibiae more brown, especially at tips, tarsi dark at tips, rest pale. Wings rather slender, with broad black stripe, leaving behind a narrow hyaline strip over ends of the posterior cells, and the cells on the front margin beyond stigma hyaline, the stigma wholly dark, areola postica nearly hyaline. Radial sector and median vein united for some distance, areola postica very small, little longer than high, stigma moderately long, almost acute behind, apical side short. Hind wings mostly brown.

Length 3 mm.

Nearest to *C. dolobratus*; differs in the stigmal markings, and shorter stigma, and antennae less heavy.

ALLOPSOCUS, gen. nov.

Group of *Psyllipsocus*, *Tapinella*, etc. Body rather broad and flat. Head broad, eyes small, bare, ocelli three, antennae with third and fourth joints long, beyond small indistinct joints. Wings broad and rounded; radius ends blindly, thus no stigma, radial sector arises at right angle to radius, once forked; median vein and radial sector connected by a short cross-vein; no branches to median, nor to cubitus; anal and axillary veins unite in the margin, veins and margin of wing ciliate. In the fore wing there is a narrow posterior outer margin, not traversed by veins, this space is hyaline, while the rest of wing is dark. Hind wings (Plate 1, fig. 10).

TYPE.—*A. marginalis*, sp. nov.

ALLOPSOCUS MARGINALIS, sp. nov.

TYPE.—M. C. Z. 10,786. Philippines — Luzon: Mt. Makiling (C. F. Baker).

Head whitish, labrum black, under side of head with a dark mark on each side, antennae whitish, third and fourth joints with long bristly hair, mostly on inner side, head above with scattered bristly hair; thorax in front pale, pleura dark; front legs pale, middle legs with dark femora, hind legs wholly dark; abdomen dark. Fore wings dark brown, with the exception of the hyaline or whitish narrow outer posterior margin. Veins darker brown, with few hairs, more numerous on margin of wing. Hind wings slightly fumose all over. Venation (Plate 1, fig. 10).

Length 2.5 mm.

PERIPSOCUS PUMILIS, sp. nov.

TYPE.—M. C. Z. 10,808. Florida: Monticello (Scammell).

Pale yellowish red, thoracic notum hardly darker, antennae brownish, wings almost hyaline, faintly infusate, stigma with dark basal spot; veins pale. Head broad, with few erect bristly hairs; antennae minutely hairy, about two thirds the length of the wing. Wings narrow, tip broadly rounded; stigma slender; radial sector forks before end of stigma, the fork being longer than the pedicel; median vein with short branches toward tip; median and radial sector meet at one point.

Length 1.7 mm.

In general similar to *P. californicus*, but smaller, and lacks dark spots at ends of veins, and fork of radial sector much longer, and median forks farther out than in that species.

PERIPSOCUS PERUANUS, nov. sp.

TYPE.—M. C. Z. 10,803. Peru: Lima, 21–30 August (H. S. Parish).

Pale brown; thorax above darker brown; legs pale brownish, scarcely darker at the tips; wings uniform pale brown, the veins darker brown, stigma hardly darker than rest of the wing, a dark dot at end of the anal vein. Wings rather short, and broadly rounded at tip, the stigma not its length from the tip, rounded behind; the radial sector forks just beyond the band of the stigma, the outer branch of the median vein arises a little beyond this, the first branch opposite the bend of the stigma; the median and radial sectors united for a distance equal to the width of the stigma; also about as far in the hind wing.

Length 2.7 mm.

DYPSOCUS PARVULUS, sp. nov.

TYPE.—M. C. Z. 10,794. Straits Settlements: Singapore (C. F. Baker).

In general appearance similar to *D. apicatus* and *D. coleoptratus*; differs from them in having the antennae very slender throughout. The head is flattened, with short, dense hair, the antennae are pale brown, minutely hairy. The fore wings have a broad dark stripe over most of surface, leaving the apical costal region clear, but a dark band across the tip of the stigma, the posterior margin is scarcely hyaline except in the areola postica and a little before it.

The radial sector and median are connected by a cross-vein, the apical branches are not short and crowded as in the other species of the genus, but like *Caecilius*, the areola postica is very small and short, and the stigma of moderate length, rounded behind.

Length, to tip of wings 3 mm.

I place *parvulus* in this genus on account of the separation of radial sector and median vein and the structure of the head, but the rest of the venation and the antennae are like *Caecilius*. The *D. dolobratulus* Hagen is a *Caecilius* very close to *C. himaylanus* Enderl., besides the types I have *dolobratulus* from Singapore and Island of Penang.

CALOPSOCUS IRESCENS, sp. nov.

TYPE.—M. C. Z. 10,783. Borneo: Sandakan (C. F. Baker).

Head brown; thorax and abdomen dark brown; legs brown, anterior tibiae and tarsi rather paler. Wings deep black, iridescent blue in certain lights. Vertex, seen from in front, broadly, but not deeply, concave (not narrowly incised as in *C. infelix*). Wings proportionally longer than in *C. infelix*, and densely reticulately veined, even from before the middle to near the outer edge.

Length of wing 4 mm.

PERLIDAE.

ISOGENUS HASTATUS, sp. nov.

TYPE.—M. C. Z. 10,820. N. C.: Andrews, middle of May (F. Sherman). N. H.: White Mts. (E. P. Austin).

In many ways similar to *I. frontalis* but darker, especially the wings. The head has the posterior yellow spot continued into a hastate mark between the posterior ocelli, a pale spot each side on lower face. The seventh ventral segment is slightly convex in the middle and there orange in color, the following segments have apical margins narrowly orange, and the basal segments are pale on tips. The ocelli form a triangle nearly equilateral, and the wings have no cross-vein from near tip of radial sector to radius, otherwise much as in *I. frontalis*.

Expanse 36 mm.

Although differing in venation the genital characters are so similar to those of *Isogenus* that I include it in that genus as Dr. Hagen had done in the collection.

KATHROPERLA, gen. nov.

Tarsi with apical joint much longer than the other two segments together; setae rather short. Palpi similar to *Perla*; eyes small; ocelli three; median vein running parallel to radius at base, anal cell with two separated branches, no cross-veins in apical part of wings except beyond end of the subcosta; in hind wings but two median cross-veins far apart. Differs from *Perla* and other Perlidae in the great length of the head behind the eyes, being nearly as long as the pronotum.

TYPE.—*K. perdita*, sp. nov.

KATHROPERLA PERDITA, sp. nov.

TYPE.—M. C. Z. 10,819. British Columbia: Kaslo (Taylor).

Brown; face in front of the anterior ocellus and laterally up to the posterior ocelli yellowish; palpi and antennae brown; pronotum with median pale stripe, and one each side near the lateral edge; meso- and metanotum with basal median pale spot; abdomen dark brown. Wings but little infumate, darker beyond the end of the subcosta; about eight costal cross-veins; three or four beyond end of the subcosta; radial sector with one branch and that nearer to the anastomosis than to tip, anastomosis disjointed; about eight median and cubital cross-veins. Posterior ocelli as near to each other as to the eyes; ocellar triangle nearly equilateral; from each posterior ocellus a ridge extends obliquely to the anterior edge of the eye. Pronotum about once and two thirds as broad as long; sides and corners rounded. Ventral plate of female large, emarginate at tip.

Expanse 36 mm.

ACRONEURIA MANCHURIANA, sp. nov.

TYPE.—U. S. N. M. PARATYPE.—M. C. Z. 10,833. Six specimens. Manchuria and Korea: Yalu River, 150 to 200 miles from mouth (A. DeC. Sowerby coll.).

Dull brown. Head more or less dull yellowish, especially behind the ocelli, ocelli more or less plainly connected by a black V-mark. Abdomen almost black above, yellowish brown beneath; legs and cerci similar. Wings brown infumate, rather paler in middle of cells so that some veins appear broadly margined with dark; venation brownish, not pale on costal part. Ocelli in a nearly equilateral triangle, hind ocelli larger than front one, hind ocelli about as near eyes as to each other; lateral bosses curved, about as near ocelli as to eyes, anterior bosses large, oblique, widely separated. Pronotum about one

and one half times as broad as long, little if any narrowed behind, anterior angles acute, behind rounded. Ventral plate of male not extended upward, the boss apical, pale, and transversely wrinkled, each side the ventral plate shows a pale, shallow impression. The appendages are elongate and recurved, their tips approximate, each tip with an oval scar on the inner surface. Ventral plate of female but little enlarged, its margin slightly concave in the middle and yellowish, the next segment pale on middle and apical margin. Wings of good size, no cross-veins in apical field, radial sector usually two-branched, upper anastomosis oblique; about ten costal cross-veins.

Expanse ♂ 52 mm.; ♀ 60 mm.

OYAMIA NIGRIBASIS, n. sp.

TYPE.—U. S. N. M. ALLOTYPE.—M. C. Z. 10,831. Two specimens. Manchuria and Korea: Yalu River, 150 to 200 miles from mouth, May 1914 (A. DeC. Sowerby coll.).

Black, a pale spot on clypeus, and one extending from each hind ocellus to the eye. Basal joint of antenna dark, beyond the antenna is pale for one third to one fourth the way out, beyond black. Wings largely yellow-veined, in female less so, and the membrane darker than in the male, costal area of both yellow. Abdomen yellow, in female blackish on base beneath. Legs bright yellow, with distinct dark bands on the bases and tips of femora and tibia, tarsi dark. Ocellar triangle nearly equilateral; hind ocelli hardly larger than the front one, plainly nearer to each other than to the eyes; lateral bosses elliptic, nearer to hind ocelli than to the eyes, anterior bosses long, out-curved, upper inner ends bent inward. Pronotum about one and one fourth broader than long, a little narrowed behind, corners angulate. Wings fairly long, anastomosis oblique, about twelve costal cross-veins, four sub-costals; radial sector two or three branched beyond the anastomosis. Tips of male appendages broad, flat, not notched.

Expanse ♂ 42 mm., ♀ 54 mm.

In this and in *O. flavotincta* McLachlan the third joint of the palpi is plainly curved. It is not mentioned in other species, but I presume it is a peculiarity of the genus.

PERLA DUPLICATA, sp. nov.

TYPE.—M. C. Z. 10,818. Va.: Fairfax Co.; Newington, 4 June (S. A. Rohwer).

Pale brown; head largely pale, dark between the ocelli, on middle of lower face, and back of the eyes; basal joint of antennae pale, rest and the palpi brown; pronotum with broad pale median stripe, most of meso- and the

metanotum pale; abdomen pale, brown toward tip; sternum and venter pale; legs pale brownish, tips of tarsi darker. Wings brown, costal area, especially of the hind wings, darker than elsewhere, venation dark brown. Posterior ocelli a little nearer to the eyes than to each other, ocellar triangle broader behind than long; lateral bosses slender, transverse, appearing to reach in a curved line toward the posterior ocelli; pronotum one and one third broader than long, rather narrower behind, sides parallel, anterior edge convex; setae rather short. Radial sector three-branched, four cross-veins beyond end of the subcosta, anastomosis continuous, seven to nine median and cubital cross-veins; the male shows on both seventh and eighth ventral segment a small median process.

Expanse 23 mm.

PERLA SUBVARIANS, sp. nov.

TYPE.—M. C. Z. 10,817. Va.: Great Falls. Md.: Great Falls, High Island, 15 April to 12 May.

This species is what I have recorded as *P. varians* in the Washington list. It is similar in many ways to that species, but on comparison with types of Walsh's species it differs in several points. The ventral plate of the female is more triangular, and longer in the middle, the pale median spot on vertex of head in both is in *P. subvariens* continued forward as a narrow streak into the ocellar area, the stripe on thorax is more narrow, and the posterior ocelli are nearer to each other than in *P. varians* although still a little nearer to the eyes than to each other; the pronotum is proportionally a little longer than in *P. varians*.

Expanse 38 mm.

PERLA EXPANSA, sp. nov.

TYPE.—M. C. Z. 10,816. Col.: Grant, 16 August (E. C. Jackson).

Black; head with a very broad reddish yellow median stripe, interrupted only at the anterior ocellus by a narrow transverse black band; pronotum with broad median stripe pale; last segments of the abdomen pale brownish; setae pale brown. Wings slightly infuscated, the veins (except costals) dark brown; radial sector three-branched, two cross-veins beyond end of the subcosta, about six median and cubital cross-veins, second anal vein curved. Posterior ocelli much nearer to the eyes than to each other, the ocellar triangle much broader behind than long, lateral bosses transverse, not far from posterior ocelli; the pronotum one and one third broader than long, sides nearly parallel; female ventral plate extremely large, rounded, and convex.

Expanse 32 mm.

Very similar to *Perla modesta*, also from Colorado, but the ventral plate is very much larger; and the venation much darker.

PERLA VERTICALIS, sp. nov.

TYPE.—M. C. Z. 10,815. N. H.: Franconia (Mrs. A. T. Slosson).

Brown; most of lower face and most of vertex back of ocelli pale yellowish and even between posterior ocelli, only sides of head back of eyes dark; a median pale stripe on the pronotum, broader in front; ventral plate of female pale; legs and antennae pale brownish; wings nearly hyaline, veins brown; radial sector two-branched, six median and cubital cross-veins; anastomosis continuous. Posterior ocelli much nearer to the eyes than to each other, ocellar triangle broader than long; lateral bosses about as near antennal ridges as to the posterior ocelli; pronotum one and one half broader than long, sides nearly parallel, front and hind margins both convex; female ventral plate very large and long.

Expanse 30 mm.

Near to *P. modesta* of Colorado, but it is smaller and the ventral plate much longer.

PERLA INCESTA, sp. nov.

TYPE.—M. C. Z. 10,838. Oregon (Hagen coll.).

Brown; in general similar to *P. varians*, *P. similis* etc. in having a narrow median stripe of pale on the pronotum, and a pale median spot on top of the head, and a pale spot each side on lower face; abdomen brown, pale on venter near tip, setae and legs pale. Wings also similar to these species, nearly hyaline, with yellowish venation, radial sector three-branched, three cross-veins beyond end of subcosta, latter ending at anastomosis, latter disjointed, six to eight median and cubital cross-veins, first anal vein strongly sinuate just beyond the anal cell. The posterior ocelli are nearly twice as near to eyes as to each other, the ocellar triangle almost twice as broad behind as long; lateral bosses small and as close to antennal ridges as to posterior ocelli. Pronotum one and one fourth broader than long, sides nearly parallel.

Expanse 30 mm.

It differs from all the related forms in the shape of the ventral plate which is nearly straight across at tip with a distinct median emargination.

PERLA ANAMENSIS, sp. nov.

TYPE.—M. C. Z. 10,830. Anam (Frustorpher).

Pale yellowish, a large black spot over the ocellar area; pronotum and rest of thorax rather brownish; wings nearly hyaline, veins yellow; legs pale, femora tipped with dark. Ocelli large, posterior ocelli plainly closer to each

other than to the eyes, ocellar triangle longer than broad behind; lateral bosses large, full as near posterior ocelli as to the eyes, and three times as far from the antennal ridges. Pronotum one and one fifth broader than long, sides nearly parallel, a little narrowed behind, surface strongly rugose. Wings long, radial sector two- or three-branched, three cross-veins beyond end of subcosta, anastomosis oblique, seven or eight median and cubital cross-veins, second and third anal veins strongly curved. Ventral plate of the female (Plate 4, fig. 44).

Expanse 54 mm.

PERLA NIRVANA, sp. nov.

TYPE.—M. C. Z. 10,834. India: Kooloo (M. M. Carleton).

Pale yellowish brown, a large black spot over ocellar area, and extending broadly each side to the eyes, leaving the bosses yellow; a small dark spot above bases of antennae, sternum, and venter yellow, setae and legs yellowish, the femora at tips, and the tibiae at bases and tips narrowly blackish; wings nearly hyaline, veins yellowish. Ocelli large, plainly closer to each other than to the eyes, ocellar triangle a little longer than broad behind, lateral bosses rather large, oblique, a little nearer to posterior ocelli than to the eyes, and fully twice as far from the antennal ridges. Pronotum one and one half broader than long, sides nearly parallel, surface strongly rugose. Wings long, radial sector four-branched, five or six cross-veins beyond end of subcosta, eight or ten median and cubital cross-veins, second and third anal veins slightly curved, far apart at origin. The male has a large scar near tip, and each side is a curved depression.

Expanse 45 mm.

PERLA CARLETONI, sp. nov.

TYPE.—M. C. Z. 10,836. India: Kooloo (M. M. Carleton).

Yellowish brown; ocellar space black, and black on middle of front margin of head, legs blackish; abdomen marked with black and apical part of ventral plate black, setae brown; wings faintly brown, venation yellow-brown. Ocelli very large, posterior ocelli a little nearer to each other than to the eyes; the ocellar triangle longer than broad behind; lateral bosses large, as near posterior ocelli as to eyes and still farther from antennal ridges. Pronotum one and one half broader than long, slightly narrowed behind, strongly rugose above. Wings long, radial sector three-branched, six or seven cross-veins beyond end of the subcosta, the anastomosis oblique, seven or eight median and cubital cross-veins, third anal vein much curved, second but little; female ventral plate (Plate 4, fig. 51).

Expanse 52 mm.

PERLA REPANDA, sp. nov.

TYPE.—M. C. Z. 10,837. Chile (Hagen coll.).

Pale yellowish throughout (probably pale greenish when alive); antennae and palpi scarcely brownish, no definite marks anywhere. Head rather small; ocellar triangle longer than broad; posterior ocelli much larger than anterior ocellus, and more than two diameters apart, still farther from the eyes; lateral bosses elliptic, about size of posterior ocelli, plainly nearer to ocelli than to the eyes. Pronotum fully one and one half times broader than long, slightly narrowed behind, anterior angles acute, strongly rugose above. Wings long and large; about twelve costal cross-veins before the end of the subcosta, six or seven beyond; the anastomosis is very oblique, but little disjointed; radial sector with two or three branches beyond anastomosis; the anal region shows the basoanal vein arising long before the second vein from the anal cell, the latter vein runs down nearly at right angles and then suddenly curves outward (not seen in any other species). The last ventral segment of the male shows a large elliptic smooth space, and curved depressed area each side.

Length of body 18 mm.; expanse 57 mm.

NEOPERLA BASALIS, sp. nov.

TYPE.—M. C. Z. 10,832. India: Lebong, 5,000 ft. (Rosenberg).

Deep black, wings black; base and sides of pronotum, bases of wings, rest of thorax and most of abdomen yellow, setae and antennae yellowish, legs yellowish, front and mid tibiae and a line above on femora black, as also the tarsi. Ocelli over three diameters apart, nearly twice as far from the eyes; lateral bosses slender, almost twice as close to eyes as to the posterior ocelli, and full as close to antennal ridge. Pronotum one and one half as broad as long, plainly narrowed behind, front margin convex; ventral plate of female not projecting, but straight across, with a distinct, small, median, triangular incision. Radial sector twice branched, two cross-veins beyond end of subcosta, anastomosis straight across, hardly disjointed, nine or ten median and cubital cross-veins.

Expanse 24 mm.

Closely resembles *N. nigriceps*, but rather larger and the yellow on venter, base of wings, and pronotum readily separate it.

NEOPERLA HAGENI, sp. nov.

TYPE.—M. C. Z. 10,840. Borneo: Mindai, 18 June 1882 (Grabowsky coll.).

Pale dull yellowish throughout, antennae beyond the basal third brownish, tips of tarsi dark. Head rather narrow; ocelli moderately large, but little

more than diameter apart, and plainly farther from the eyes; lateral bosses small, situate much lower than the ocelli, and twice as far from ocelli as from eyes. Pronotum one and one half times broader than long, slightly narrowed behind; setae about as long as the abdomen. Wings moderately long, one branch to radial sector, which is much nearer to anastomosis than to the tip; anastomosis disjointed, the upper part nearly straight across, three median and cubital cross-veins, all far apart; subcosta runs out to the anastomosis, one weak cross-vein beyond it.

Length of body 6 mm., of fore wing 8 mm.

NEOPERLA VISCAYANA, sp. nov.

TYPE.—M. C. Z. 10,827. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Dull sordid yellowish, a black mark including the ocelli, blackish in front on middle of head; palpi brown; antennae black except the basal joint pale; pronotum scarcely embrowned each side; all tibiae brownish, femora yellow, tarsi dark on tips. Wings almost hyaline, veins dull brownish yellow. Ocelli large, about one and one fourth diameter apart, more than two diameters from eyes; lateral bosses about size of ocelli, transversely elliptic, as near to ocelli as to the eyes; pronotum one and one half times broader than long, narrowed behind. Wings with radial sector two- or three-branched beyond the anastomosis, latter scarcely disjointed, the upper part straight across, two or three cross-veins beyond end of subcosta, six to eight median and cubital cross-veins. Ventral plate of female slightly convex on hind edge.

Length of body 10 mm.; of fore wing 13 mm.

A male, probably of the same species, from the island of Penang, is eight millimeters long; the tibiae are scarcely darkened, the pronotum rather longer, and lateral bosses larger.

NEOPERLA REMOTA, sp. nov.

TYPE.—M. C. Z. 10,835. Brazil: New Freiburg (Bescke coll.).

Related to *N. dilaticollis*, but ocelli more remote. Reddish brown; head more or less blackish in front, pronotum darker on sides, but not with a definite stripe; mesonotum with two dark spots; abdomen pale, the segments below marked with black; antennae and palpi brown. Wings tinted as in *N. dilaticollis*, veins dark, costa not paler; four costals beyond end of subcosta, ten before; about nine median cross-veins and five cubital ones; radial sector forks twice beyond anastomosis; anastomosis not disjointed, upper part not oblique; legs pale, rather golden, front femur and tibia plainly dark before tip,

others less so. Ocelli small, more than five diameters from each other, and about as far from eyes; lateral bosses about the size of the ocelli, rounded, half way from ocelli to eyes; pronotum one and one fourth times broader than long, anterior angles sharp, posterior rounded, plainly broader in front than behind; ventral plate long, with a small median sinus.

Length of body 10 mm., fore wing 13 mm.

NEOPERLA CAMPOSI, sp. nov.

TYPE.—M. C. Z. 10,829. Ecuador: Pifo (F. Campos R.).

Yellowish brown. Similar in many ways to *N. longicauda* and *N. bolivari*, wings faintly tinted with brown, venation mostly brown, as in those species, but the radial sector is pale as far out as the anastomosis, beyond which it is dark. Palpi and antennae dark; the head barely marked with brown in front; the sides of pronotum broadly brown; the meso- and metanotum brownish, with a pale median stripe through to the abdomen, which is yellowish at base, darker at tip; cerci brownish, paler toward tip; legs pale, femur with black near tip above, tibia pale, unmarked. Ocelli scarcely diameter apart, more than two diameters from the eyes, lateral bosses large, oblique, hardly more than one half an ocellus diameter from either eye or ocelli. The wing shows twelve costal cross-veins and three others beyond end of the subcosta; six to eight median and cubital cross-veins; radial sector three- or four-branched beyond anastomosis, anastomosis scarcely disjointed, the upper part oblique. Last segment of male shows a slight elliptical tubercle near tip.

Length of body 15 mm., of fore wing 24 mm.

ISOPERLA MORMONA, sp. nov.

TYPE.—M. C. Z. 10,822. Utah: Vineyard, 22 June (Tom Spalding).

Yellowish green; head slightly darker in the middle; pronotum hardly darker on sides; antennae and palpi pale brownish; abdomen setae and legs yellowish, tarsi darker. Wings yellowish green, with brownish venation; radial sector but once forked and one cross-vein beyond end of subcosta; about five median and cubital cross-veins. Head but little broader than pronotum; ocelli in nearly equilateral triangle, posterior ocelli about one fourth nearer to eyes than to each other; lateral bosses small, rather nearer to the antennal ridges than to the posterior ocelli; pronotum one and one half broader than long, sides parallel; ventral plate of the female barely produced.

Expanse 18 mm.

ISOPERLA ISOLATA, sp. nov.

TYPE.—M. C. Z. 10,824. N. C.: Hot Springs (Mrs. A. T. Slosson); Black Mts., May.

Brown; top of head and sides by the eyes yellow, and a median extension into the ocellar triangle, lower part of face pale; antennae brown; palpi black; pronotum brown on sides, pale in middle, this pale stripe extending back over rest of thorax; abdomen brown, the last few ventral segments with pale spots on apical margins; setae black; legs black, femora more brown. Head broader than prothorax, ocelli rather large, the ocellar triangle little broader than long, the posterior ocelli about twice as close to the eyes as to each other, lateral bosses about one half way from the posterior ocelli to antennal ridges. Pronotum one and one half times broader than long, sides nearly parallel. Wings brownish, rather darker on costal part, yellowish on extreme costal base; veins dark brown; radial sector twice forked beyond anastomosis, two or three cross-veins beyond end of subcosta, about seven or eight median and cubital cross-veins; anal cell very small.

Expanse 22 mm.

Differs from *I. maculata* in having ocelli much closer to eyes, from *I. brunncipennis* in pale thoracic stripe.

ALLOPERLA FIDELIS, sp. nov.

TYPE.—M. C. Z. 10,823. Calif.: Tahoe, Great Alpine Creek, 24 June (F. Grinnell).

Pale greenish; no distinct marks on the head, but rather brownish in front, antennae beyond basal portion blackish; pronotum with faint dark mark on each lateral disc, and with the edges dark, meso- and metanotum with black U-shaped mark around the scutelli, abdomen with a median black stripe above; tips of tarsi dark. Wings hyaline, venation greenish. Ocelli form a triangle broader behind than long, the posterior ocelli hardly closer to the eyes than to each other; lateral bosses rather nearer to antennal ridges than to the posterior ocelli. Pronotum more than twice as broad as long, sides rounded, and rather narrowed behind. Female ventral plate with a distinct median emargination. Radial sector nearer to the anastomosis than to tip; six or seven median, and four cubital cross-veins; anastomosis disjointed.

Expanse 22 mm.

By marks of pronotum and absence of marks on the head it is allied to *A. pacifica*, which is smaller, and has the ventral plate entire.

NEMOURA JAVANICA, sp. nov.

TYPE.—M. C. Z. 10,825. Java: Batavia (Rosenberg).

Dull black, pronotum rather paler, legs pale, unmarked, tips of joints scarcely darker; ocelli form an equilateral triangle, hind ocelli two thirds as far from

eyes as from each other; pronotum one and one fifth broader than long, quadrangular, corners but little rounded, front margin convex. Wings long and slender, nearly uniform brown, the costal area rather darker, the costal cross-veins much more than its length beyond end of the subcosta, four to five median cross-veins, seven to nine cubital cross-veins, radial sector strongly geniculate at base, first anal vein scarcely sinuate beyond anal cell.

Length to tip of wing 9 mm.

Differs from *N. jacobsoni* by unbanded legs, and different male genitalia.

NEMOURA REMOTA, sp. nov.

TYPE.—M. C. Z. 10,826. Straits Settlements: Island of Penang (C. F. Baker).

Dark brown, shining, legs pale yellowish brown, wings brown, some of the cells paler in the middle, vertex with a faint pale spot in the middle behind the ocelli. Ocelli are far apart, being fully twice as near to eyes as to each other, the ocellar triangle very low; the pronotum is a trifle longer than broad, much narrower than the head, and slightly broader in front than behind, the anterior margin rounded. The radial sector is almost geniculate at base, and arises only a little beyond the median vein; the costal cross-vein is nearly its own length beyond end of subcosta; anal cell twice as long as broad, the first anal vein just beyond the cell bends down sharply.

Length to tip of wings 7 mm.

NEMOURA STYLATA, sp. nov.

TYPE.—M. C. Z. 10,821. Va.: Glencarlyn, 18 May, Chain Bridge, 25 May.

Pale brown, legs more yellow, wings evenly faintly infumate. Lateral ocelli about twice as far apart as from the eyes, anterior ocellus far forward so that the ocellar triangle is nearly equilateral. Pronotum about one and two thirds as broad as long, plainly broader in front than behind, the anterior corners rounded, and the anterior margin convex. Wings with radial sector almost geniculate at base; costal cross-vein about its length beyond end of subcosta; anal cell twice as long as broad, first anal vein but little sinuate at base; median area not swollen above. The male inferior appendages are longer than in our other species.

Length 6.5 mm.

PARANOTOPERLA THOREYI, sp. nov.

TYPE.—M. C. Z. 10,839. Fijis (Thorey).

Pale brownish, minutely pubescent, very evident on the legs. Ocelli in a slightly longer than equilateral triangle, posterior ocelli nearly twice as far

apart as from the eyes; lateral bosses transverse, outer edge near the eye, inner end is the length of boss from posterior ocellus; antennae as long as wings. Pronotum quadrangular, the corners rounded, plainly a little broader than long, a transverse impression across the front part, surface only slightly rugose. Legs long and slender, hind tibia longer than femur, basal tarsal joint hardly as long as the apical, second very short. Wings long and slender (Plate 6, fig. 85) only five median and cubital cross-veins, six cross-veins in disc of wing, all far apart; hind wing with a few cross-veins in disc, no median cross-veins; setae as long as body, many-jointed.

Length of wings 7.5 mm.; of hind femur 2 mm.

Smaller than *P. australica*, fewer cubital cross-veins, and pronotum plainly broader than long.

LEUCTRA MALAYANA, sp. nov.

TYPE.—M. C. Z. 10,828. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Blackish, abdomen rather paler, legs pale, darker at tips of joints, antennae pale on basal fifth, beyond brown, wings nearly uniform brown. Head minutely pubescent; hind ocelli fully three times as far apart as from the eyes, ocellar triangle low; the lateral bosses larger than ocelli, and close to the lower edge of the eyes; antennae clothed with appressed hair and a whirl of erect bristles near tip of each joint; each joint slightly fusiform. Pronotum a little longer than broad, sides parallel, corners rounded; legs minutely pubescent; wings slender, subcosta ends but little beyond the middle of wing, about six median cross-veins, and about ten cubital cross-veins, the last much beyond end of subcosta; last segment of female from below shows a small rounded plate base (Plate 4, fig. 45).

Length to tip of wing 6 mm.

SIALIDAE.

PROTOSIALIS MINORA, sp. nov.

TYPE.—M. C. Z. 10,841. Straits Settlements: Singapore (C. F. Baker).

Head, thorax, basal two joints of antennae, femora, and extreme base of wings, yellowish. The pro- and mesothorax rather dull, abdomen, rest of antennae black; wings and tibia brown, tarsi rather pale. Structure similar to other species of the genus, but in the fore wings both upper and lower

branches of the median vein run out to the margin unforked; of the three connecting veinlets between radius and radial sector the second is more than twice as near the third than to the first; 8 costal cross-veins.

Length 8 mm.

PROTOSIALIS BIMACULATA, sp. nov.

TYPE.—M. C. Z. 10,842. Bolivia: Rio Longo (H. Fassl).

Black, with yellowish head and prothorax. In general closely similar to *P. mexicana*, but the head has a distinct black spot above each antenna, and behind the eye is a black trifold mark back of the upper part of eye, instead of the much larger bifid mark back of entire eye in *P. mexicana*. The wings are infumate much as in *P. americana*, not as black as *P. mexicana*, the venation about as in *P. mexicana*, the basal cross-vein between the cubitus and first anal ends on cross-vein much beyond origin of radial sector, the first cross-vein between radius and radial sector is transverse instead of oblique as in *P. mexicana*.

Length to tip of wing 15 mm.

SIALIS AEQUALIS, sp. nov.

TYPE.—M. C. Z. 10,843. Va.: Falls Church, 19 April to 25 June (N. Banks). Mich.: Agricultural College (R. H. Pettit). Maine: Norway (S. I. Smith). Mass.: Milford, 8 June. N. J.: Lafayette, 26 May.

Deep black, some specimens showing the wings paler beyond the basal third. Structure in general similar to *S. infumata* and *S. concava* but the ventral plate of male is nearly as long as broad, with subparallel sides, and a broadly rounded tip, usually covering all the other parts from below; the last dorsal segment of male is broadly excavate below, not so deeply nor so narrowly as in the other species. The hair of head and thorax is very short as in the other eastern species; the middle veinlet connecting radius and radial sector oblique as in other eastern species.

Expanse 16–19 mm.

SIALIS CALIFORNICA, sp. nov.

TYPE.—M. C. Z. 10,844. Calif.: San Emigdio Canon, Kern Co., 3 June (F. Grinnell); Summit, Sierra Nevada (Osten Sacken); San Geronimo, 20 April (Osten Sacken); Saucelito, 15 May (H. Edwards).

Deep black; with rather long dense hair on head and thorax, and with the second connecting veinlet between radius and radial sector straight as in the

European species. Last dorsal segment of male seen from above is rather long, slightly narrowed and nearly truncate at tip, being only a little indented in middle, from behind it is shallowly, broadly emarginate and shows below a recurved spear-shaped plate with a depressed middle area and appressed to the ventral plate.

Expanse 18–26 mm.

This has been considered the European *S. fuliginosa*, but the male genitalia are of very different structure.

SIALIS ROTUNDA, sp. nov.

TYPE.—M. C. Z. 10,845. British Columbia: Bon Accord, 20 May (J. Russell).

Deep black throughout. The second of the connecting veinlets between radius and radial sector is straight across, one vein between subcosta and radius, about fourteen costal cross-veins. The last dorsal segment of the male shows a large horseshoe-shaped depression; the ventral plate is large, extending almost to tip of last segment, nearly truncate across tip; the lower appendages of last segment are elongate, parallel-sided and from below the tip of last dorsal segment appear as short, triangular pieces, separated by their width.

Expanse ♂ 23 mm.; ♀ 33 mm.

RAPHIDIDAE.

RAPHIDIA BIFURCA, sp. nov.

TYPE.—M. C. Z. 10,846. British Columbia: Wellington (G. Taylor).

Black; face in front of antennae yellow; antennae yellow on basal part, beyond brown; vertex with the usual red marks, the median one constricted near middle, the lateral ones very irregular; pronotum more or less pale lineate behind; legs yellow-brown, femora darker; tip of superior plate of male yellow. Wings hyaline, venation pale brown, yellow near base, stigma long, pale yellow, four cells behind it. In general very similar to *R. admirata* but differs in genitalia, the superior plate (seen from above) being furcate, and (seen from the side) it is tapering; the two lower processes are dark, rather stout, and with a tooth or enlargement near inner base. In the female the last ventral segment has a large, apical yellow spot, and a median ridge; the ovipositor reaches to tip of wings.

Expanse 27 mm.

MYRMELEONIDAE.

CYMOTHALES HERMOSA, sp. nov.

TYPE.—M. C. Z. 10,565. N. Angola: Dalla Tando, 29 November (Le Moulton); two specimens.

Wings marked in general as in *C. speciosa* and *eccentros*; only very small stigmal spot as in *eccentros*; apical band broken up more by spots than in *eccentros*. The upper part of the middle band is broader in front than behind (in *eccentros* broader behind). Head pale, black between and above antennae, antennae pale, dark on extreme base, vertex with a hump each side which has a slightly bilobed summit. Pronotum black, a pale line each side, and behind are two oblique lines on each side; thorax blackish, with a pale line each side; pleura dark. Abdomen pale with two black stripes above; legs pale, femur of front legs black except at base and tip, with dense black hair, and longer erect black bristles, hind femora also with black bristles. Front tarsus has basal joint longer than the fifth, the spurs a trifle longer than first and second joints together. In fore wing four to six cross-veins before any are crossed, but the radial sector arises farther out at the middle band; nine or more branches to radial sector; in hind wing one cross-vein before radial sector.

Length fore wing 30 to 34 mm., hind wing, 35 to 38 mm.

This belongs to the section or subgenus *Mironius*.

CHAETOLEON, gen. nov.

Differs from *Brachynemurus*, *Austroleon*, and allied genera in having erect enlarged bristles upon the mesonotum in front, also in that on the fore wing the second and third anal veins are united for a short distance, the second anal, however, does not approximate the first anal vein in its basal part (as in the *Formicaleonini*). The antennae are long and slender, with much enlarged tip. Legs slender, with very long bristles, the tarsus shorter than the tibia, the first tarsal joint a little longer than the second, spurs equal, two tarsal joints. Wings moderately slender, in fore wings three cross-veins before radial sector, in hind wings two such cross-veins; radial sector in fore wings arises much before the fork of the cubitus.

TYPE.—*Myrmeleon pumilis* Burmeister.

Brachynemurus pusillus Currie also belongs here.

PUREN.

I include in this genus *Myrmeleon inscriptus* Hagen. It differs from *Psammoleon* in having the basal joint of the tarsus much longer than

the second joint, and the spurs elongated and curved only near tip. In *P. inscriptus*, as in the genotype, the costal area of the fore wing is biareolate; in *P. connexus* this area has but one series of cells. Both differ from the type of Puren in having more (6 or 7) cross-veins before the radial sector in the fore wing.

PUREN CONNEXUS, sp. nov.

TYPE.—M. C. Z. 10,848. Calif.: San Jacinto Mts., 25 June (F. Grinnell).

Head pale, a black interantennal mark, two transverse rows of black spots across vertex; pronotum black, a narrow median pale line, and on each side a spot in front and a line behind; mesonotum with pale spot and stripe each side. Abdomen black. Legs mostly black, hind tibia pale on outer basal half, femora and tibia with black bristles, some black and many white hairs; basal joint of tarsus twice as long as the second, spurs equal almost two joints, but little curved except near tip, the claws hardly one half as long as the spurs. Wings hyaline; veins pale, marked with black, mostly in long streaks. As in *P. inscriptus* there is in the fore wing a prominent flexuous dark line, formed by connecting the oblique mark at end of anal with that up from end of cubitus, this line is not as deeply incurved as in *P. inscriptus*. In both fore wings there is a strong vein from forking of cubitus obliquely upward and backward to the median, possibly this is abnormal. The wings are narrower than in *P. inscriptus*, and the costal area has but a single series of cells.

Expanse 54 mm.

EREMOLEON NIGRIBASIS, sp. nov.

TYPE.—M. C. Z. 10,847. Utah: St. George, 5, 6 June (T. Spalding).

Pale, rather reddish, an indistinct dark band below antennae, and faint dark marks on vertex, pronotum with remnants of two submedian dark lines, and a sinuous line each side, rest of thorax with few sinuous dark lines and dots, pleura with two dark stripes, the upper one just below the wings; abdomen pale, second segment with dark at base and near tip, others with dark just before tip; legs pale, tibiae and femora somewhat dotted with dark. Wings hyaline, venation rather rufous, the cross-veins mostly black, and other veins at junction with cross-veins; stigma and faint spot at end of cubitus dark; a prominent black spot at base of fore wing; hind wings with veins only slightly marked with dark. Structurally similar to *E. macer*, but antennae shorter, legs less slender, spurs equal three tarsal joints; wings hardly as

elongate as in that species, six or seven cross-veins before radial sector in fore wings, eight branches of the radial sector; the radial sector arises much beyond the cubital fork.

Expanse 53 to 58 mm.

1
DIMARES HAGENI, sp. nov.

TYPE.—M. C. Z. 10,555. Brazil: Chapada (H. H. Smith).

Marked on the same plan as *D. elegans*, but the markings much darker, less broken up, broader and tending to form bands, the four costal marks before stigma extend more than one half way across the wing, while the numerous small spots in the hind part of the wing are so arranged as to almost form bands with the costal marks; the apical mark consists of a dark preapical band and an apical spot. In the hind wings the marks also almost form bands; the spot over the forking of the cubitus extends obliquely upward in an unbroken band; the apical mark consists of three spots, but little separated; markings of the body as in *D. elegans*, but rather broader. Size, a little larger than *D. elegans*.

This is perhaps what Navas refers to as the true *elegans*, but his variety *lepida* is the true *elegans* as Perty's figure plainly shows the form with reduced spots.

GYMNOCNEMIA BOLIVIANA, sp. nov.

TYPE.—M. C. Z. 10,650. Bolivia: Rio Longo (H. Fassl).

Head pale, a large black mark above antennae and extending down between them, two dark spots on vertex behind; palpi and antennae pale, the latter dark toward tips; pronotum pale, lateral margin dark, and a narrower dark stripe each side near the marginal one, leaving a broad median space pale; rest of thorax pale, with various large dark spots, the scutelli largely pale; the abdomen mostly pale, apical half of segments above dark; legs pale, thickly dotted with dark, the femora and tibia dark at the tips. Wings hyaline; veins alternately black and pale, the cross-veins largely black, in apical and posterior part of fore wings are faint clouds over some of the cross-veins; stigma pale, a dark mark at its base. Wings moderately slender, almost acute at tips; seven cross-veins in fore wings before radial sector, eight branches of the radial sector, several costals before the stigma are forked. Antennae long; pronotum longer than broad; legs slender, very much as in *G. variegata*.

Length of fore wings 30 mm.

Differs from *G. leptocera* in marks of the pronotum.

PSAMMOLEON PARVULUS, sp. nov.

TYPE.—M. C. Z. 10,648. Brazil: Chapada (H. H. Smith).

Face pale, dark mark from eye to eye over antennal bases, a gray band above antennae, vertex dark, without definite marks; palpi pale, last joint dark; antennae dark, narrowly annulate with pale; pronotum dark, with a short pale stripe each side, not reaching either end; rest of thorax dark, some sutures pale; abdomen dark; legs pale, front femora mostly dark, a pale stripe on upper front side, middle and hind femora dark at tip and near base, tibia dark at tips, middle and front tibiae also dark near middle and toward base, and with some small spots, tarsal joints dark at tips. Wings hyaline, veins alternately dark and pale, but more dark than pale, fore wings with oblique dark line up from end of anal vein, and another at end of cubitus as usual, stigma hardly distinct; wings slender, acute; seven cross-veins before radial sector in fore wings, nine branches of radial sector. Legs not much thickened, with very long black bristles and short white hairs; spurs as long as two to more than three joints.

Length of fore wings 21 mm.

MYRMELEON INCOMPLETUS, sp. nov.

TYPE.—M. C. Z. 10,651. Ecuador: Posorja (F. Campos).

Face shining black, only lower part of clypeus, and the sides near eyes pale; vertex dark, four submedian spots and one each side darker, a pale spot each side also; palpi with last joint black; antennae dark, tips darker; pronotum dark, indistinctly marked with pale, the anterior sides, a median stripe in front, and a submedian stripe each side pale; rest of thorax dark, sides with pale sutures; abdomen dark, tips of some segments pale above; legs pale, femora shining, with black streak above and below, tibia black beneath and lined each side, tarsi mostly black. Wings hyaline; veins pale, with dark streaks, cross-veins more dotted with dark; stigma pale, scarcely distinct; in fore wings seven cross-veins before radial sector, four in hind wings, ten branches to radial sector; wings moderately slender, acute at tips. Pronotum much broader than long, tarsus of front legs scarcely longer than the tibia, spurs a little shorter than first tarsal joint.

Length of fore wing 29 mm.

MYRMELEON PALLIDIPES, sp. nov.

TYPE.—M. C. Z. 10,649. Brazil: Chapada (H. H. Smith).

Head mostly reddish to red-brown, clypeus and lower face pale, above the antennae rather more black, vertex without definite marks, palpi pale; an-

tennae brown; pronotum reddish brown, rather paler in front, rest of thorax also reddish brown; abdomen brown to black; legs a faint reddish yellow, almost wholly unmarked, the tibia rather darker on outer base; wings hyaline, veins yellowish, a few, mostly cross-veins, show minute dark dots at base of hairs, stigma pale. Pronotum broader than long; legs with few bristles, and very fine hairs, spurs not as long as first tarsal joint, tarsus of front leg very long, the first four joints together nearly as long as the tibia. Wings moderately slender, acute at tips, seven cross-veins before radial sector in fore wings, four in hind wings, ten branches of the radial sector.

Length of fore wings 31 mm.

HEMEROBIIDAE.

HEMEROBIUS TAGALICUS, sp. nov.

TYPE.—M. C. Z. 10,849. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Pale yellowish, a black mark under each eye, and a curved dark mark each side under antennae extending inward from each eye; palpi black, the extreme tip pale; antennae pale yellowish throughout; pronotum with a broad dark stripe each side, rest of thorax and the abdomen yellowish brown; legs pale, unmarked. Wings hyaline, the gradates black, anal region mostly black, the extreme edge pale, veins interruptedly brown and pale in streaks. Wings rather broad; seven outer gradates, five inner, the upper one of inner series far from the others, the middle ones of this series and the lower ones of outer series not far apart, and an extra cross-vein in fork of median vein considerably before the inner series; lower branch of median vein bent toward the cubitus; three radial sectors, the third with four branches; in hind wings the stigma is reddish, darker at base, venation pale, about nine cross-veins well separated; superior male appendages long, very slender toward tip.

Expanse 14 mm.

HEMEROBIUS RIZALI, sp. nov.

TYPE.—M. C. Z. 10,850. Philippines — Luzon: Benguet; Baguio (C. F. Baker).

Head pale yellowish; a broad dark mark under each eye; palpi dark, tip pale; antennae and legs pale, unmarked; pronotum with a dark stripe on each side, rest of thorax and the abdomen yellowish brown, with yellowish hair. Wings hyaline, faintly infuscate over the gradate series; veins pale, with dark streaks, gradates dark, a dark spot at connection of median and cubitus; hind wings hyaline, veins pale, except the gradates dark. Fore wings rather long,

but with a moderately broad costal area; three radial sectors, third with three branches; seven outer and six inner gradate veinlets in nearly parallel series; lower branch of medius bent toward cubitus. In the hind wings two cross-veins, well separated. Superior appendages of the male, seen from the side broadly furcate below; the outer part longer, more slender and its tip curved across to the opposite appendage.

Expanse 15 mm.

BORIOMYIA BRUNNEA, sp. nov.

TYPE.—M. C. Z. 10,856. Montana: Midvale (C. E. Brown).

Face shining black, vertex and basal joints of the antennae dark brown, rest of antennae pale brownish; pronotum brown, rest of thorax and the legs pale; abdomen brown. Wings a uniform reddish brown, unmarked, veins concolorous, not dotted. Wings slender, fully two and one half times as long as broad, four radial sectors, the cross-vein between first sector and the median is much beyond the forking of median, that from median to the cubitus is at the forking of the median vein; about seven inner gradate veinlets, in an even series; only three or four outer gradates, widely separated, the last much nearer to the inner series than the others.

Expanse 15 mm.

BORIOMYIA LONGIPENNIS, sp. nov.

TYPE.—M. C. Z. 10,857. Calif.: Berkeley (E. A. Essig).

Pale yellowish, a red mark on each cheek under the eye, and a red spot each side on the clypeus, with traces of reddish below bases of the antennae; a short, median reddish line on the pronotum, rest of thorax, abdomen, and legs unmarked; two black dots close together at base of each fore wing. Wings hyaline, fore wing faintly mottled with pale brown on the outer half, most noticeably over the gradate series, veins pale, but with some distinct black dots, each about the distance of which separates veins from the next. Wings long and slender, over two and one half times as long as broad, three or four radial sectors, first connected to median by a cross-vein near the forking of the median, latter connected to cubitus much before forking of median, two parallel strongly oblique gradate series, outer rather nearer to the inner than to the margin, about seven veinlets in each series.

Expanse 20 mm.

NOTIOBIELLA MINIMA, sp. nov.

TYPE.—M. C. Z. 10,852. Borneo: Sandakan (C. F. Baker).

Head pale, dark on lower part, black spot under each eye; palpi black; antennae pale; pronotum mostly dark; thorax and abdomen brown, latter

paler beneath; legs pale. Wings brownish, veins yellowish brown, faintly interrupted with dark dots, gradates black, a deep black spot near base of wings over subcostal cross-vein and those behind it. Wings not as slender as in *N. affinis* and *N. iniquus*, venation about the same, the second radial sector does not fork till behind the stigma, where the radius also forks.

Length of fore wing 3.5 mm.

Differs from allies in smaller size, darker wings, in forking of second radial sector and proportionally broader wings.

NOTIOBIELLA VALIDA sp. nov.

TYPE.—M. C. Z. 10,851. Borneo: Sandakan (C. F. Baker).

Head pale, dark across below the antennae, and dark beneath eyes, a spot each side on vertex, connected behind; palpi brown; antennae pale; pronotum dull blackish, the posterior sides pale; thorax blackish, scutellum pale; abdomen pale, tips of segment dark (♀), in the male the abdomen pale, dark on last two segments; legs pale, tibia with dark spot near tip. Wings slightly fumose, venation reddish, gradates black and also the forkings of most of the veins, dark spot at base of stigma, and extreme base of costal margin black, no large black spot near base. Wings broad, rounded at tip, the second radial sector forked three times before the stigma where it is connected back to radius by a cross-vein; in the male there is a large, impressed, circular, scabrous, dark mark situated on the first radial sector a little before it forks; the male appendages are very large.

Length of fore wing 4.5 mm.

This species may, perhaps, form a new subgenus.

MICROMUS PICTIPES, sp. nov.

TYPE.—M. C. Z. 10,853. Philippines — Luzon: Benguet; Baguio (C. F. Baker).

Head pale, with dark spot each side on face and below the eyes, vertex with a black dot each side; pronotum dark with two pale tubercles near middle, rest of thorax and the abdomen dark; legs pale, much spotted, the femora with dark band before the middle, the tibia with dark band before the middle and another near tip, the tarsi banded. Wings hyaline, venation dark and pale in the usual streaks, but more dark than pale, the spots along the outer costal margin very distinct, the gradate veins heavily bordered with blackish, a large spot at end of the anal vein, and a mark at bend of the cubitus. Nine

or ten outer, and six inner gradate veins; both in a fairly even series. Wings rather long and slender, but rounded at tip.

Expanse 20 mm.

Related to *M. morosus*, but distinct by the banded legs.

MICROMUS IGOROTUS, sp. nov.

TYPE.—M. C. Z. 10,854. Philippines — Luzon: Los Banos, Mt. Makiling. Benguet; Baguio (C. F. Baker).

In general similar to *M. pusillus* Gerst., but a trifle larger, and with broader wings. Color and markings similar to that species, the wings marked in the same way, but the dark marks stand out more distinctly. The radial sector with four or five branches. The gradate veins are not in an even series as in *M. pusillus*, but very irregular, the outer series with one or more near each end out of line, and sometimes an extra one. In the hind wings besides the dark gradate veins the radial sector is black by the forkings.

Expanse 15 mm.

ZACHOBIELLA gen. nov.

A hemerobiid; no recurrent vein, two radial sectors; medius and cubitus not approximated, but as wide apart as are other veins, two short series of gradates. In hind wings one radial sector, several branched, and two cross-veins. Head much as in *Micromus*, but the vertex more sloping; hind tibiae fusiform. In appearance like a narrow-winged *Micromus*, with reduced venation, but the separated median and cubitus quite different. The forked cubitus separates it from *Neurorthus*, to which it is not very closely allied.

TYPE.—*Z. punctata*, sp. nov.

ZACHOBIELLA PUNCTATA, sp. nov.

TYPE.—M. C. Z. 10,855. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Pale; black mark below each eye; palpi black; antennae pale; vertex polished, punctate, bristly; pronotum dark, with a pale median stripe, which extends back over the rest of the thorax, abdomen yellow-brown; legs almost white, unmarked, hind tibia strongly fusiform. Wings hyaline; veins pale; cross-veins heavily black, the forkings of veins, except the basal ones, have triangular dark spots, wings long and rather slender, both radial sectors soon

fork, and their branches fork only near margin; anal veins with several short branches near the tips; the hind wings have the radial sector soon forked, the upper branch with two other branches; a cross-vein between branches of the radial sector, and another between the lower branch and the median vein.

Expanse 10 mm.

CHRYSOPIDAE.

NOTHOCHRYSA SIMPLEX, sp. nov.

TYPE.—M. C. Z. 10,858. Borneo: Sandakan (C. F. Baker).

Pale yellowish, unmarked; antennae beyond basal part slightly darker. Prothorax scarcely longer than broad, sides nearly parallel. Wings hyaline, veins pale yellowish, stigma scarcely marked; wings moderately long, acute at tips, costal area but little swollen; third cubital cell very oblique at tip, divisory veinlet terminates above middle of end; nine outer, seven inner gradates in nearly parallel rows, outer row fully as near inner as to outer margin, the last one or two inner series much before the others; in hind wings seven outer, six inner gradates, last one or two much before others.

Length of fore wings 11 mm.

NOTHOCHRYSA PALLICORNIS, sp. nov.

TYPE.—M. C. Z. 10,859. Straits Settlements: Singapore (C. F. Baker).

Pale yellowish; pronotum has a rounded black spot each side near hind end, abdomen dark near tip; legs pale, unmarked. Wings hyaline, with pale yellowish venation, except outer gradates are black in fore wings, and in widest part of the radial area three cross-veins are dark in the middle of their length; in hind wings the radial sector is dark for a short distance before the stigma, other veins pale. Prothorax much longer than broad, narrowed in front; wings about as in *N. aequalis*, tips rounded, costal area fairly broad, gradates approaching each other behind; nine outer and seven inner ones; in hind wings eight outer and seven inner gradates.

Length of fore wing $14\frac{1}{2}$ mm.

CHRYSOPA NECROTA, sp. nov.

TYPE.—M. C. Z. 10,860. Straits Settlements: Singapore (C. F. Baker).

Head yellowish, rather darker below; palpi dark; antennae pale, unmarked, prothorax pale, with narrow lateral margin and a median line black; mesono-

tum black across front margin of the lobes, metanotum dark each side at base of wings; legs with the tibiae partly dark, hind tibia dark on more than basal half. Wings hyaline, veins mostly pale, the cross-veins mostly dark, also the gradates, the base of subcosta and radius black, the latter, however, pale for a short distance near base; origin of the radial sector, first and second cubital cross-veins, and several veins behind are margined with blackish, stigma dark at base. Pronotum short and broad, narrowed in front. Wings rather broad, rounded at tips, divisory veinlet cuts off large part of third cubital cell; nine outer and seven inner gradates in nearly parallel series.

Length of fore wings 14 mm.

CHRYSOPA ATRIORIS, sp. nov.

TYPE.—M. C. Z. 10,861. Straits Settlements: Singapore (C. F. Baker).

Head below antennae mostly shining black, but with a transverse pale line across base of clypeus; palpi black; first and second joints of the antennae reddish brown, rest pale, vertex pale; pronotum pale, the sides dark, almost black in front; legs pale, unmarked. Wings hyaline, veins pale, but some cross-veins margined, very faintly brown, and several cross-veins near base of wing partly dark. Prothorax as broad as long, slightly narrowed in front. Wings slender, almost acute, costal area narrow; third cubital cell very long, divisory vein ends much before its middle, about at the cross-vein; gradates few, scattered, and irregular, about four in outer, three in inner series; hind wings very slender, acute, veins pale, four outer and two inner gradates.

Length fore wing 9 mm.

CHRYSOPA NIGRIBASIS, sp. nov.

TYPE.—M. C. Z. 10,862. Straits Settlements: Island of Penang (C. F. Baker).

Pale, cheeks dark and three dark spots in a transverse row across face below the antennae; mesonotum with dark band across connecting bases of fore wings. Wings hyaline, veins mostly pale greenish, the costa of fore wings for a short distance is black, and many of the costal cross-veins are black at extreme tip. The pronotum is as broad as long, narrowed in front. The wings are moderately broad, acute at tips, the costal area near base much broader than in most species of the genus; six outer and five inner gradates, in fairly even series, rather far apart, but parallel; third cubital cell with strongly oblique tip, divisory veinlet ending near the end of the cell.

Length of fore wing 11 mm.

CHRYSOPE CALIPTERA, sp. nov.

TYPE.—M. C. Z. 10,863. Borneo: Sandakan (C. F. Baker).

Pale yellowish green, a black spot on each cheek, and a vertical black line between antennae, pronotum with a dark spot on middle of each side, anterior lobe of mesothorax with two small dark spots, larger spot at base of fore wings, and one on pleura below base of fore wings; legs pale, unmarked. Wings hyaline, veins pale greenish, gradates and many cross-veins black, and dark margined, or dark at one end; the costals pale, a dark spot at base of stigma, one over base of first and second branches of radial sector that run to margin, and another at end of anal vein; origin of radial sector and several anal veins dark; hind wings unmarked, veins pale. Wings slender, acute at tips, costal area rather narrow, gradates irregular and close together, five or six in each series, divisory veinlet ends a little beyond the cross-vein. Prothorax as broad as long, scarcely narrowed in front.

Length of fore wing 13 mm.

CHRYSOPE EVERES, sp. nov.

TYPE.—M. C. Z. 10,864. French Guiana.

Yellowish green, unmarked; antennae black, but basal joint pale; palpi pale. Wings hyaline; veins green, radial cross-veins blackish in middle, and the gradates dark; stigma greenish. Basal joint of antennae moderately swollen within, nearly as much as in *C. fiebrigi*; pronotum about twice as broad as long, not narrowed in front, front margin convex. Wings moderately slender, tips almost acute, costal area of medium width, inner gradates of two to four veinlets, seven or eight in outer series, rows nearly parallel and not far apart; divisory veinlet ends beyond the cross-vein, about one half way out to the tip of the cell.

Length of fore wings 13.5 mm.

Differs from *C. caucana* and *C. claveri* in lacking red to sides of pronotum, and less black on the cross-veins; it is also a rather broader bodied insect.

CHRYSOPE BICARNEA, sp. nov.

TYPE.—M. C. Z. 10,866. Florida: Miami (G. F. Moznette).

Differs from all our other species in having two red lines on the basal joint of each antennae, one above and one on outer side, the one on upper side extending back on vertex obliquely outward, and sometimes there is a red spot on the face under each antenna; otherwise the insect is green with a pale

yellowish face, and pale legs. The venation is green, the costal and radial cross-veins marked with black in the middle, the gradate veinlets black, and a few cross-veins in basal part of wing dark. The divisory cell is long and slender, ending beyond the cross-vein above. There are about five inner and nine outer gradates in fore wing, the two series very close to each other, parallel, the outer row almost twice as near to the inner as to the outer margin; the fore wings are moderately broad, acute at tips; the hind wings slender, acute, the venation mostly pale, the gradates more separated than in fore wings, the inner row of four, the outer of seven. The pronotum is rather short, narrowed in front.

Expanse 30 mm.

ALLOCHRYSA MAGNIFICA, sp. nov.

TYPE.—M. C. Z. 10,865. Brazil: Chapada (H. H. Smith). French Guiana: Godeberd-Maroni (Le Moul't).

Dull yellowish, marked with red-brown; vertex above antennae largely reddish, but the elevated triangular part is pale; basal joint of antennae with a transverse black mark across upper tip, and a black spot on inner side near tip, beyond many of the joints are black beneath for one half way to tip of antennae. Pronotum dark each side, meso- and metanotum also dark on sides; abdomen dark above, paler beneath; legs pale. Wings hyaline, stigma prominently dark; in proper light a dark shade from outer gradates to margin of wings, veins pale, outer gradates and marginal forks dark, some of costal and radial cross-veins dark at ends; eight to nine outer, and ten to eleven inner gradates, parallel, but inner series extends basally; in hind wing nine inner, and seven outer gradates.

Length of fore wings 23 mm.

Related to *A. longicornis*, but distinct by marks of basal joint of antennae.

MANTISPIDAE.

MANTISPA VERTICALIS, sp. nov.

TYPE.—M. C. Z. 10,778. Australia—N. T.: Port Darwin, 30 November (L. Dodd).

Head yellow; a broad median black stripe on the face, large dark spot above the antennae, inclosing a median pale spot, and a broad dark band on vertex from eye to eye; antennae pale on base, dark beyond; pronotum with a median projection to the anterior lobe, two tubercles behind, slender part more than twice as long as the anterior lobe, transversely wrinkled, but not

bristly, anterior lobe dark on each side, posterior part dark just before mesothorax; meso- and metanotum reddish brown, scutelli yellow, pleura reddish brown; abdomen red-brown above, paler beneath; legs pale, anterior coxae reddish brown toward tip; femora pale reddish brown on outer side, blackish on inner side and above, tibia reddish. Wings hyaline, the usual stripe reddish, stigma moderately long, but hardly as slender as in *M. vittata*; the venation dark, except a little near base; first basal cell hardly longer than the third, with one branch, second cell with two branches, third with one; basal joint of tarsus nearly equal to others together, claws simple.

Length to tip of wings 11 mm.

MANTISPA NEWMANI, sp. nov.

TYPE.—M. C. Z. 10,774. Borneo: Sandakan (C. F. Baker).

Related to *M. cora* Newman. Head yellow, with a median black stripe over face, above antennae a broad transverse brown spot containing two small pale spots; antennae black, basal joints pale beneath; pronotum marked as in *M. cora*, but the median stripe is much darker, the lateral stripes narrow, connected at each end to median. Thorax above dark, with two pale spots in front, one each side inward from base of fore wings, and the scutelli pale; pleura wholly pale; legs pale, middle and hind pair unmarked except the middle tibiae have a dark stripe on underside, front legs with femora black on more than apical half of inner side, outer side with two dark clouds one near middle and one at tip; tibia black, except the extreme base. Wings hyaline, the usual stripe black; veins black, all basal veins pale, except subcosta and radius, and radius is pale just behind the stigma; abdomen pale beneath, segments dark at tips, above dark, mottled with pale; first radial cell with one branch, others with two each.

Length to tip of wings, 10–12 mm.

MANTISPA COMPLETA, sp. nov.

TYPE.—M. C. Z. 10,776. Philippines — Luzon: Mt. Makiling (C. F. Baker).

Head pale, marked with a large brown spot as in *M. luzonensis*; antennae black, except pale basal joints; pronotum almost wholly dark brown, no spots on anterior lobe and scarcely a trace on the sides; meso- and metanotum dark, the scutelli yellow; pleura dark, with few pale spots; abdomen mostly dark, bases of segments above and below pale, and pale spots on each side of each segment; legs pale, tips of hind tibiae dark, front femora almost wholly dark on both sides, only the extreme base pale, tibia dark, but with a pale streak

below. Wings hyaline, usual streak black, venation black, except base of cubital and the axillary vein yellow. Venation as in *Mantispa*, first radial cell with one branch, second with one, and third with two branches.

Length 7 mm.

Similar to very small *M. luzonensis*; differs in wholly dark pronotum, in dark outer side to front femora, and the legs less marked.

MANTISPA DECEPTA, sp. nov.

TYPE.—M. C. Z. 10,775. Philippines — Mindanao: Surigao; Butuan (C. F. Baker).

Marks of head similar to *M. annulicornis*, the face mark rather broader; antennae black, except basal joints pale beneath; pronotum dark in front, pale behind, but outline of the dorsal mark fairly distinct, the dark of the anterior lobe is faintly divided in the middle, and with a pale spot on each side; meso- and metanotum black on sides, pale through the middle; abdomen pale, with dark marks near tips of the segments, last ventral of male with a median mark only (*M. annulicornis* male has a basal median dark spot and two smaller apical ones); legs pale, anterior coxae lined with brown, femora dark brown on apical two thirds of both sides, tibia mostly brown. Wings hyaline, usual dark streak faintly indicated, stigma yellowish; venation black, but basal venation and subcosta and radius mostly pale. First radial cell with one branch, second and third with two each; pronotum scarcely wrinkled, minutely hairy above.

Expanse 17 to 19 mm.

EUCLIMACIA GERSTAECKERI, sp. nov.

TYPE.—M. C. Z. 10,777. Straits Settlements: Singapore (C. F. Baker).

Similar to *E. morosa* of Gerstaecker, but lacks the markings on the body, and the position of the pale in the wing is different. Body black, the last few segments of the abdomen are red, antennae slightly rufous beneath. Thorax as short as in allied forms, the middle part with conical protuberances above. Wings slender, veined as in related forms, first radial cell with five branches, others with four each, costal area of fore wings with twelve cross-veins. Both wings with anterior half or third colored, mostly dark brown, rest of wings hyaline, extreme tip of wings yellowish, in the fore wings the colored part beyond middle is pale yellow for a short distance, and near the base the dark gives off a branch between the median and cubital veins, not, however, reaching the hind margin.

Expanse 37 mm.

LIMNEPHILIDAE.

COLPOTAULIUS TARSALIS, sp. nov.

TYPE.—M. C. Z. 10,880. Col.: Ward (E. J. Osler).

In color markings and general appearance close to *C. perpusillus*. It differs from that species in lacking a row of black spines on the front side of the front femora, and in that the first joint of the front tarsus in the male is much shorter than the second joint, in fact less than half as long, and most important in the shape of the male genital parts (Plate 7, fig. 104), which seen from the side show no median projecting part which is characteristic of *C. perpusillus*. Of the same size as that species.

ZAPOROTA, gen. nov.

Related to Colpotaulius, but the spurs 0, 2, 2, and the pronotum short. The male palpi are very short, the second and third joints together scarcely as long as width of face from eye to eye; the front tibia faintly curved in the male, almost without spines except two close together at inner tip; front femora with short dense hair beneath; legs with few spines, last joint of hind tarsus with several distinct spines beneath; no ocellar macrochaetae; pronotum short; bristles of mesonotum in well-defined strips. Venation of type usual in family, fore wings with rounded tip, membrane not granulate; hind wings scarcely incised at end of cubitus.

In my table of the family (Can. ent., 48, 1916, p. 118) it will run to *Allegophylax* except that it has not a granulate membrane; it differs in very short palpi, bare front tibia, and different shape of wings.

TYPE.—*Z. pallens*, gen. nov.

ZAPOROTA PALLENS, sp. nov.

TYPE.—M. C. Z. 10,878. Alaska: Demarkation Point, 30 June (W. S. Brooks).

Pale yellowish throughout, with yellowish hair; dorsum of abdomen dark, spines of legs black, and sometimes some of the veins in middle of wings are brownish. Fore wings with the first fork scarcely back of anastomosis, third fork acute on anastomosis, second apical cell very wide at base, discal cell much longer than the pedicel, radius barely curved at the stigma; in hind wings the discal cell reaches barely in front of the cubital fork. In front tarsus of the male the basal joint is as long as the second.

Expanse 14 to 16 mm.

LIMNEPHILUS ADUSTUS, sp. nov.

TYPE.—M. C. Z. 10,879. Alberta: Banff, 21 August (N. Sanson).

Black, with black and yellow hair; antennae (except basal joints) and legs (except the femora) brownish to yellowish, most of head and thorax above with yellow hair; legs with black spines. The ocellar macrochaetae farther back than the ocelli and also much closer together than are the ocelli, first joint front tarsus one and two thirds as long as second. Fore wings yellowish with much yellowish hair, and two large brown spots; one from the posterior anastomosis outward, the other over the outer two thirds of the third apical cell, extending on sides a little into the adjoining cells; stigma dark, and anal area slightly infuscated; radial sector but little bent at the stigma. The male genitalia in general similar to *L. kincaidi* but the superior appendages longer; the lower intermediate pair (which are golden) form a half circle, when seen from behind.

Expanse 22 mm.

LIMNEPHILUS CRASSUS, sp. nov.

TYPE.—M. C. Z. 10,871. Massachusetts.

Yellowish, with yellowish hair, some brown hair each side on face and on sides of pro- and mesothorax; legs with black spines. Fore wings with pale costal space, elsewhere mostly brown, heavily mottled with pale; a large, oblique spot over thyridial cell as usual, and one in the bases of apical cells; hind wings hyaline. Ocellar macrochaetae behind ocelli, and almost as far apart as are the ocelli; radius curved at stigma; in hind wings the fourth apical cell is more than one half as wide as the third at base. The male genitalia shows a large superior plate, with two flat, divergent processes, which are brown toward tips.

Expanse 27 mm.

LIMNEPHILUS MORRISONI, sp. nov.

TYPE.—M. C. Z. 10,873. Nev.: Reno (H. K. Morrison); Sierra Nevada (G. R. Crotch).

Pale yellowish, with mostly yellow hair and bristles; palpi of female only moderately long; ocellar macrochaetae almost between the ocelli. Fore wings pale brownish; the usual oblique pale mark over thyridial cell; a spot just before the anastomosis, extending backwards below; part of the fourth and most of fifth apical cells with pale spot extending into apical part of first subapical cell; one or two small pale spots above middle of the discal cell; practically no other pale marks, and all of these may be very faint. The

female genitalia shows above two furcate processes, the outer branch hairy. Spines on legs black, many on tibia of front pairs. In the male the basal tarsal joint of the front legs is very much longer than the second.

Expanse ♂ 24; ♀ 28 mm.

LIMNEPHILUS KENNICOTTI, sp. nov.

TYPE.—M. C. Z. 10,872. Hudson's Bay Terr.: Great Slave Lake, 1861 (Robert Kennicott).

Blackish, vertex and notum slightly pruinose, abdomen brownish, bristles and hair mostly black; antennae and legs yellowish, spines black. Fore wings yellowish, most of the apical and posterior parts brown, mottled with pale; the usual oblique median mark, a large spot before, and one beyond the anastomosis, pale; hind wings pale, no beard. Maxillary palpi of male very slender; legs slender, on front pair the basal tarsal joint is much longer than the second, front tibia spined to base, hind tibia very long and slender, and not spined on basal half. Ocellar macrochaetae almost between the ocelli. Fore wings rather slender, first and fifth apical cells reach but little back of the anastomosis, radius bent slightly at stigma; in hind wings the fourth apical cell is about one half as wide at base as the third apical; discal cell slightly longer than apical cells.

Expanse 19 mm.

LIMNEPHILUS ELONGATUS, sp. nov.

TYPE.—M. C. Z. 10,870. Hudson's Bay Terr.: Ft. Resoluton, Great Slave Lake (Robert Kennicott).

Yellowish; vertex and thorax brown; abdomen more yellowish brown; legs and antennae pale; hair mostly yellowish; spines of legs black; male palpi very long; ocellar bristles back of the ocelli; tibia of front legs spined to base; legs slender, in male the basal joint of front pair is very much longer than the second joint. Fore wings hyaline, yellowish, with stigma and beyond, and most of posterior part brownish, mottled with pale; large pale spots before and beyond the anastomosis, and the usual oblique thyridial spot; hind wings pale, near tip yellowish, no beard, fourth apical cell at base one half as wide as the third; in the fore wing the first fork is farther back of the anastomosis than the third fork. In the male the genitalia have very long superior appendages, concave within and toothed near tip; in the female the parts are similar to those of *L. sitchensis* except that the intermediate central piece, which in *L. sitchensis* is small and slightly bifid at tip, is here a very large and deeply divided piece reaching to tip of the superior appendages.

Expanse 25 to 27 mm.

ANABOLIA CURTA, sp. nov.

TYPE.—M. C. Z. 10,874. Massachusetts (Hagen coll.).

Black; legs and antennae yellowish; head with black hair below, yellowish above; basal joint of antennae with golden hair; legs with black spines; between ocelli and eyes, and on middle of the mesothorax the surface is sericeous. Fore wings blackish, rather densely spotted with small patches of pale hairs, especially noticeable at the outer margin, and just before the posterior anastomosis; hind wings scarcely darkened. In general closely similar to *A. mutatus* Hagen, but the marking near upper anastomosis is scarcely distinct. The male has the upper appendages as in *A. mutatus*, but the lower pair are much shorter and not strongly mucronate (as in *A. mutatus*). It is a slightly smaller species.

Expanse 26 mm.

ANISOGAMUS EDWARDSI, sp. nov.

TYPE.—M. C. Z. 10,881. Calif.: Marin Co. (Henry Edwards, James Behrens).

Black, with black bristles; some hairs on the vertex, pronotum, thorax, middle of face, and lower part of head are yellowish. Palpi pale, in the male not especially long. Antennae black, crenulate below; ocelli of moderate size, no ocellar bristles. Abdomen with a pale streak on the sides and parts of genitalia pale. Legs pale, femora mostly black, spines black, tibia I spined to the base, last joint hind tarsus not spined beneath, spurs 1, 3, 4. Wings pale yellowish, membrane rather densely clothed with black hair, giving a blackish appearance to the wing; many irregular small spots of pale hairs, not very distinct, the bristles on veins near the base of wings are long. Hind wings pale yellowish. Venation about as usual; radius not bent at the stigma, fork I only a short distance back on the cell, fork III almost as far back, discal cell much longer than its pedicel; posterior anastomosis oblique, continuous; hyaline spot on areculus and thyridium.

Expanse 28 mm.

HOMOPHYLAX CROTCHI, sp. nov.

TYPE.—M. C. Z. 10,877. Vancouver Island: Victoria, July (G. R. Crotch).

Yellowish throughout, with yellowish hair; the fore wings with distinct dark marks as follows:—the posterior half as far out as the anastomosis, the dark extending upward nearly across the discal cell, beyond the anastomosis is an oblique brown band from areculus to tip of the first apical cell, on its inner

middle with a projection toward the anastomosis; the thyridium with a hyaline white spot, and one on the arcus. Venation very similar to *H. flavipennis*, but the discal cell has a longer pedicel; the fore wings are broader and more oblique on the outer margin than in that species, and the membrane more plainly granulate. The appendages are very similar, but the lower pair, longer and more prominent.

Expanse 38 mm.

ECCLISOMYIA SIMULATA, sp. nov.

TYPE.—M. C. Z. 10,876. Nevada: Reno (H. K. Morrison).

Pale yellowish; head and thorax with black bristles, two ocellar macrochaetae just obliquely back of each ocellus; legs with black spines; spurs 1-3-4. Fore wings with pale, unmarked costal area, elsewhere pale brownish, densely mottled with rounded, whitish spots, often confluent; hind wings with apical part of veins dark. Venation about as in *E. conspersa*, first fork reaching back nearly opposite base of posterior anastomosis; radius scarcely bent at the stigma. Male genitalia closely similar to those of *E. conspersa*, the superior appendages are rather longer, and wholly pale, the median process appears to be the same, and the middle piece with furcate process also similar, as are likewise the lower lateral appendages, but instead of the intermediate black processes of *E. conspersa* there are two sets of four bristle-like pieces, the inner pair the longer.

Expanse 26 mm.

The spur formula is unusual, but the similarity in genitalia shows the ocellar macrochaetae to be a more valuable generic character.

NEOPHYLAX ORNATUS, sp. nov.

TYPE.—M. C. Z. 10,875. N. H.: White Mts. (H. K. Morrison).

Yellowish, with pale yellowish hair, some brown hair on sides of face and on sides of the pro- and mesothorax. Legs with black spines. Fore wings with pale yellowish hair, more golden near front margin, with large patches of white, and some black hairs toward tip and in two large patches behind. The white is in the apex of each apical cell and on base of second and third cells, the first and second subapical cells are nearly all white, leaving a dark line, much wider near tip, between them, the third subapical partly pale; a large pale area from behind discal cell, widening out behind, and another over the basal anal region. Hind wings pale, fringes nearly white. In structure and venation similar to *N. concinnus*.

Expanse 27 mm.

IRONOQUIA AUSTRALIS, sp. nov.

TYPE.—M. C. Z. 10,868. Chile (L. Fairmaire, Hagen coll.).

Yellowish; with mostly black hair and bristles, basal joint of antennae brownish, tips of tibiae and tarsal joints darkened, front tibiae with only a few short spines, first tarsal joint nearly twice as long as the second, spurs 1, 2, 2, abdomen brown. Fore wings dull brownish yellow, immaculate, except that the arculus is hyaline white. Fore wings moderately broad, tip rounded, membrane plainly granulate and very densely clothed with erect brown hair; discal cell much longer than pedicel, the first fork reaches barely before the anastomosis, third fork short pedicellate, fourth apical cell nearly twice as broad at base as the third, cubitus not disjointed at the posterior anastomosis; in hind wings the third fork has a pedicel nearly one half its length, membrane also hairy, but not as long nor as densely hairy as the margin. Maxillary palpi of male very long and slender; no ocellar macrochaetae.

Expanse 18 mm.

Differs from the genotype in very different male genitalia, and in pedicellate third fork.

ALGONQUINA CHILENSIS, sp. nov.

TYPE.—M. C. Z. 10,869. Chile: Corral, December (Roland Thaxter).

Pale yellowish, clothed with yellowish hair and bristles, and some brown bristles near wing base. Wings pale yellowish, fore wings very faintly marmorate with pale brown, the appressed hair mostly whitish; hyaline spots on thyridium and arculus; spines on tarsi black, and some black on front tibiae; others on tibiae and the spurs reddish. Antennae slightly crenulate beneath; maxillary palpi rather short, last joint barely longer than the others; ocelli of moderate size, no ocellar macrochaetae, posterior warts transversely elongate; thoracic notum with two submedian strips of bristles, elsewhere it is smooth; legs with spurs 1-3-4, last joint of hind tarsi without spines beneath. Wings rather broad near tip, outer margin oblique, scarcely emarginate; discal cell much longer than its pedicel, first fork broad near base, reaching back but little on discal cell, second fork broad, third acute and almost pedicellate; the anastomosis posteriorly oblique; cubitus and anal veins with long, erect bristles, those on other veins few and inconspicuous; in hind wings the apical cells are long, the third fork with a long pedicel, the discal cell reaching much before fork of median vein; the female genitalia above shows a large deeply incised plate.

Expanse 24 mm.

Although this species agrees fairly well with the North American species in most generic characters, it will doubtless form a new genus when other Chilean Limnephilidae are known.

MAGELLOMYIA, gen. nov.

Last joint of hind tarsus without spines beneath; spurs 1, 2, 3. Distinct ocellar macrochaetae; male palpi only moderately long. Wing membrane not granulate; venation about normal, but third fork in both wings is pedicellate, fourth apical cell in both wings about as broad as third at base; discal cells very long in both wings, and in hind pair reaching much before the fork of the median; first fork of fore wings not extending back of the anastomosis; radius not bent at stigma.

TYPE.—*M. moesta*, sp. nov.

In my table (Can. ent., 1916, 48, p. 121) it would run to 29, then, out on account of spur formula, would not agree with either alternative. From *Hylepsyche* it differs in normally divided anal cell, and from most of the other genera in having ocellar macrochaetae, and the nongranulate membrane.

MAGELLOMYIA MOESTA, sp. nov.

TYPE.—M. C. Z. 10,867. Strait of Magellan: near the Hassler Glacier, on detritus 1,200 ft. high, 24 May 1872.

Black, with mostly black bristles, but some on vertex and pronotum are yellowish; palpi pale, antennae brownish, slightly crenulate below; ocellar macrochaetae almost between the ocelli; legs pale, but much of femora, and the tips of other joints darkened, tarsus I with basal joint much longer than second, front tibiae with a few fairly long spines, but none near the base. Abdomen rather larger near tip than elsewhere. Fore wings moderately narrow, outer margin almost oblique; pale brownish, nearly uniform, a few whitish spots, not distinct, except one on the thyridium. In hind wings the first fork is almost pedicellate, and the third fork has a pedicel as long as itself.

Expanse 15 mm.

SERICOSTOMATIDAE.

HELICOPSYCHE MULLERI, sp. nov.

TYPE.—M. C. Z. 10,906. Brazil: Santa Catharina (F. Müller, 18).

Dark; head in front mostly pale, clothed with long pale hair, basal joints of antennae pale and with pale hair, also on the posterior warts; antennae pale

till near middle where they are rather darker; palpi pale, with brown hair; thorax with mostly brown hair, but each side above near middle is a streak of yellowish hair. Abdomen dark brown; legs pale brown, the tibiae rather darker, the tarsal joints are pale on bases, most broadly on middle tarsi, spurs dark, 2-2-4. Wings dark, clothed with golden and brownish hair, fringe brown, but there are a few pale spots in the apical fringe. In the male the ventral spine is yellowish, very slender, and slightly rounded at tip. Wings slender as in *H. borealis*, in fore wings fourth fork is long and almost reaches the anastomosis.

Expanse 10-11 mm.

HELICOPSYCHE PERUANA, sp. nov.

TYPE.—M. C. Z. 10,905. Peru: Natucana, 7,788 ft., 14 June (H. S. Parish).

Brown; head with brown and some yellowish hair on warts of vertex; basal joints of antennae dark, with some brown, and long yellowish hair, beyond the antennae are dark, the joints narrowly pale at base; palpi pale, with brown hair; hair of thorax largely brown; abdomen dark; legs pale brownish, femora mostly with white hair, tibiae darker, tarsi pale on bases of joints, the mid tarsi broadly so, spurs dark brown. Wings dark, with golden and brown hair, fringe brown, nearly black at tip of the wing; hind wings with black hair and fringe. In male the ventral spine is quite broad at base, triangular, with almost pointed tip. Wings slender as in *H. borealis*; in fore wings the fourth fork has a pedicel nearly one third its own length.

Expanse 11 mm.

GOERA OCTOSPINA, sp. nov.

TYPE.—M. C. Z. 10,883. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Yellowish, clothed with bright yellow hair; maxillary palpi recurved, with rows of yellow hair each side, labial palpi with last two joints long and subequal; basal joint of antennae long, with long, bright yellow hair. Wings clothed with bright yellow hair, especially along the veins. Venation very similar to *G. longispina*, but the enlarged smooth space above anastomosis is larger and more rounded above, the third fork is not pedicellate; in the hind wings all the apical forks are longer and more slender. On the sixth ventral segment there is a slender median process and each side of it four slender spines; the male genitalia from above resemble those of *G. longispina*, but the median spines are less long, the process at tip of lateral appendages is larger, and the lateral processes from near base are also larger than in that species.

Expanse 21 mm.

CALAMOCERATIDAE.

PHYLLOICUS LITURATUS, sp. nov.

TYPE.—M. C. Z. 10,901. Colombia: Mariquito, 5 February (E. B. Williamson).

Black; lower part of head, labial palpi, basal joint of antennae, posterior warts, and the prothorax yellow, with mostly yellow hair. Abdomen below and basal half above yellowish, last four segments above brown. Femora pale, middle and hind tibiae black, hind tarsi black, mid tarsi with the basal joint (except extreme tip) white, front tarsi with basal and part of second joints yellowish; spurs 2-4-4, preapical pair on hind tibiae with outer spur very short. Fore wings black, a curved white band from below stigma, concave outward, an inverted white V-mark over base of discal cell, one limb crossing base of median cell, the other limb crossing the apex; near base between anal veins is an oblique white streak.

Expanse 24 mm.

Related to *P. assimilis*, but marks of wings and of mid legs different.

LEPTOCERIDAE.

LEPTOCERUS MODESTUS, sp. nov.

TYPE.—M. C. Z. 10,890. Borneo: Mindai, Dusan Timor, and Kapua near Tumbong Hiang (Grabowsky).

Yellowish brown; palpi gray; vertex, thoracic notum, and anal area of fore wings clothed with long, snow-white hair, also white on margin at arcus; antennae yellowish, base of joints white, apex brown; fore wings of an even dull golden color, the apical fringe black; hind wings hyaline, gray at tip, and fringe gray; abdomen and legs yellowish. Fore wings moderately broad, discal cell very long, reaching back much before the forking of the median vein, in male forks one and three of equal length, with a moderate pedicel, in female the median has the two branches as in typical forms. In the hind wings the median vein is forked.

Expanse 11 mm.

OECETINA AUSTRALIS, sp. nov.

TYPE.—M. C. Z. 10,916. Victoria: Melbourne (Thorey).

Pale yellowish, clothed with gray hair; antennal joints dark on base; legs pale yellowish, with numerous black tarsal spines. Fore wings pale, veins

pale, cross-veins darker, clothed with gray and dark brown hair, small spots of dark hair at forking of veins, over cross-veins, and arculus, most noticeable near arculus and at end of subcosta; outer costal fringe brown, posterior fringe gray; hind wings with brown fringe. The subcosta ends free, but the radius outward from the connecting cross-vein is thicker than elsewhere; discal cell very long, longer than its pedicel, first fork a short distance back on discal cell. In hind wings the first fork is small, but distinct, third fork with a pedicel more than one half its length, fifth fork as long as the third.

Expanse 14 mm.

OECETINA DISJUNCTA, sp. nov.

TYPE.—M. C. Z. 10,915. Calif.: Arroyo Seco Canon, San Gabriel Mts., 17 June, Switzer's Camp, San Gabriel Mts., 21–22 June (F. Grinnell).

Clothed with pale yellowish gray hairs, palpi gray; antennae above with the tips of the joints dark; legs and tarsi pale. Wings yellowish gray, with yellowish hair; veins pale, the anastomosis darker, the three veinlets are each well separated from the next; in the male the costal fringe rather short, much shorter than in *inconspicuus* (*micans*). Abdomen pale; a median dark line above, and the segments near tip dark. The appendages show a large convex plate each side, with a deep emargination near the lower edge.

Expanse 19 mm.

OECETINA ANGUSTA, sp. nov.

TYPE.—M. C. Z. 10,887. Borneo: Dusan Timoc, Kapua near Tumbong (Grabowsky).

Pale yellowish, with yellowish, gray, and black hairs. Head, palpi, and antennae with pale hair, latter not distinctly annulate; thorax with yellowish and gray hair. Legs pale yellowish. Fore wings with fine yellow hair, and semierect pale and black scales, mostly along the veins, the black forming distinct spots and streaks; three black spots on upper apical margin, four on lower apical margin, one of the larger spots near costal margin one half way out, another before the stigma, one over thyridium, and various scattered black scales; fringe brown. Hind wings with pale brown hair and fringe. Wings long and slender, first fork acute at base and sessile, third fork long pedicellate, the discal cell is nearly twice as long as its pedicel; hind wings very narrow, acute at tips, outer costal margin concave, first fork inconspicuous, third and fifth forks very short.

Expanse 9 mm.

TRIAENODES PALPALIS, sp. nov.

TYPE.—M. C. Z. 10,895. Kamerun: Ja River, Bitze.

Brown, with yellowish and black hair. Antennae yellowish, tips of joints above dark; maxillary palpi with a long fringe on each side of second, third, and fourth joints, which is black below and yellowish above, these three joints are very long and subequal in length, the fifth joint plainly shorter than any of them. Thorax yellowish brown; abdomen dull, dark brown; legs pale, with yellowish hair. Fore wings with some black and much reddish hair; veins dark, the cubitus and anastomosis hyaline white, first fork scarcely longer than the pedicel, discal cell much longer than pedicel; in hind wing the base of the second apical cell is longer and reaches back farther than the base of the fourth apical cell.

Expanse 26 mm.

Larger than other African species and peculiar on account of short fifth palpal joint.

SETODES TERMINALIS, sp. nov.

TYPE.—M. C. Z. 10,884. Borneo: Dusan Timoc (Grabowsky).

Pale yellowish; antennae whitish, annulate with brown; palpi pale yellow, basal joints not at all thickened; head and thorax with white hair; legs whitish. Fore wings clothed with pale yellowish hair and fringe, except on the terminal fifth where there is black hair and fringe enclosing about a dozen snow-white dots, mostly on veins, four of them on the outer margin; hind wings with pale hair, the extreme tip and fringe slightly darker. Wings slender, acute, as in *S. punctata*; first fork with a pedicel one half its length, third fork with a pedicel one fourth its length; in hind wing the first fork almost lost, first apparent fork and the third forks of equal length.

Expanse 10 mm.

LEPTOCELLA GEMMA Müller.

In the collection of the M. C. Z. is a set of Müller's species sent by him to Dr. Hagen. Three species of *Leptocella* are present, one, *Setodes gemma*, has yellow wings and silver bands. It is smaller than the species figured as *L. gemma* by Ulmer (Gen. insectorum, fasc. 60, pl. 37, fig. 8), and there are no series of black dots near anastomosis and the wing is much more yellow, the two silver bands are farther apart, and there is no trace of the third band; the superior male appendages are deeply forked at tip, each branch of equal length.

LEPTOCELLA DIMINUTA, sp. nov.

TYPE.—M. C. Z. 10,900. British Guiana: Bartica (H. S. Parish).

Whitish, clothed with white hairs, tips of antennal joints barely dark. Fore wings clothed with white hairs and with many black scales through the middle area, forming a more or less distinct slightly curved stripe from near base to toward the tip. Wings rather short, third fork with a pedicel very much shorter than that to first fork. The male genitalia has the superior median plate short, the superior appendages long, slender, not enlarged at tip, and often curved downward, the inferior appendages are slightly sinuous, and almost pointed at the tip.

Expanse 12 to 14 mm.

LEPTOCELLA SPARSA, sp. nov.

TYPE.—M. C. Z. 10,899. Argentina—Misiones (Jorgensen).

Body is yellowish, clothed with white hairs; tips of antennal joints dark. Wings with mostly whitish scales on basal part; near middle are three rather yellowish bands, each outlined by black scales, and between them silvery white; in the region of the anastomosis mostly silvery, with numerous black dots tending to form lines or elliptical figures; near the apex are two silvery bands, rest of apical part yellowish, the usual marginal black patch contains four pale spots. The first fork is only a little longer than its pedicel, the third fork with a pedicel about as long as the width of the discal cell. The superior male appendages are cylindrical, but enlarged and truncate at tip, not distinctly emarginate.

Expanse 24 mm.

This is probably the species figured by Dr. Ulmer as *L. gemma*.

LEPTOCELLA SEPARATA, sp. nov.

TYPE.—M. C. Z. 10,898. Brazil: Santa Catharina Province (F. Müller); Rio de Janeiro (B. P. Mann).

Pale yellowish, clothed with white hair; antennae broadly banded with brown. Fore wings clothed with white hair; in basal third there are black streaks on several veins, and in apical third black spots on apical veins, between are several (about four) oblique yellowish bands, one from the stigma, one beyond and connected to it; and before the stigma an oblique band and a part of another starting from hind border; sometimes there is more yellow in the basal portion; venation about as in other species, the discal cell does not

reach to fork of median vein, and first and third forks are subequal. In male genitalia the superior appendages have the tip very broad; the superior median piece is extremely short.

Expanse 24 mm.

HYDROPSYCHIDAE.

AETHALOPTERA DYAKANA, sp. nov.

TYPE.—M. C. Z. 10,885. Borneo: Dusan Timoc (Grabowsky).

Pale-greenish white; basal joints of antennae more red-brown, other joints broadly annulate with brown. Wings greenish hyaline; fore wing with six small dark spots; one on cross-vein connecting the anals, the next on cross-vein from first anal to cubitus, one on base of connecting veinlet to median cell, a small one at base of median cell and one on the radius obliquely above it, one on the anastomosis, and scarcely visible one on veinlet above anastomosis to the radius. The venation is similar to that of Indian specimens of *A. sexpunctata*, but the relation of anal veins to arculus is very different (Plate 6, fig. 72), the median cell is larger, and the veinlet connecting the median cell to the cubitus extends towards base of wing, instead of outwardly.

Expanse 15 mm.

AMPHIPSYCHE PARVA, sp. nov.

TYPE.—M. C. Z. 10,886. Borneo: Mindai (Grabowsky).

Whitish; wings hyaline, with whitish veins; some of the antennal joints very narrowly dark at tips; postantennal warts hemispherical (σ^7), not their diameter apart. Venation of the male similar to that of *A. proluta*; the radius is more strongly sinuate at stigma, the pedicel of the first fork is concave above, and the vein behind it also a little curved; the median vein at base of median cell runs obliquely upward before going straight back to wing-base. Differs from the Javan *A. meridiana* (σ^7 unknown) in the longer first fork, in the sessile fourth fork, and in that the veinlet from median cell to the cubitus runs backward, instead of outward, and in the course of median vein at base of median cell.

Expanse 16 mm.

MACRONEMA QUINQUEPUNCTATUM, sp. nov.

TYPE.—M. C. Z. 10,889. Philippines — Luzon: Nueva Vizcaya; Imugin (C. F. Baker).

Pale yellowish throughout; tips of antennal joints narrowly dark; wings yellowish, each fore wing with five black spots, subequal in size. The most

basal one is on the cross-vein between cubitus and medius, the next is on the upper side of the anal vein about one half way out, the third on the radial sector about one half way to discal cell, the next on the cross-vein behind the median cell, and the fifth above the discal cell; hind wings unmarked. In structure closely similar to *M. fasciatum*; in the hind wings the sixth apical cell extends even a little before the cross-vein; in fore wings the discal and median cells about as in *M. fasciatum*. The apical segment of the inferior male appendages is shorter than in *M. fasciatum*.

Expanse 30 mm.

MACRONEMA OBSCURUM, sp. nov.

TYPE.—M. C. Z. 10,892. Madagascar: Tananarive (Chulliat).

Face brown, palpi brown, basal joint of antennae dark brown, second joint yellowish, beyond black, vertex black, warts pale brown, thorax shining black, abdomen dull brown, legs yellowish, femora and tarsi rather darker. Wings densely clothed with fine black hair, the basal costal space pale, and with several mostly rounded, spots of pale hair, the largest spot over the base of median cell, about four spots before it, and three beyond it, one of which is below the discal cell, one near arculus, and one just before end of radius; hind wings with black hair, the costal space yellowish. Venation very much as in *M. scriptum*. The maxillary palpi have the second joint longer than the first, the third joint nearly one and a half times the second, the fourth about two thirds of the third.

Expanse 21 mm.

MACRONEMA SUBAEQUALIS, sp. nov.

TYPE.—M. C. Z. 10,903. Argentina — Misiones: Haut Parana, San Ignacio, May (Wagner).

Black, head (except vertex) golden, with golden hair; antennae black; palpi black on base, pale beyond, the second, third, and fourth joints short, subequal; postantennal warts small, yellowish. Thorax and abdomen black; legs yellowish, front tibiae largely dark, tips of tarsi dark. Fore wing dark brown; two large, costal, yellowish spots, one beyond middle, other near stigmal region; hind wing also brown, and also with two costal, pale spots, about in same position. Fore wings rather narrow; discal cell small, but not distinctly closed, first and second anal veins unite long before widest part of anal area; median cell not very large. In hind wings the first sector complete, connected by short cross-vein to the radius.

Expanse 22 mm.

Belongs to *Pseudomacronema*, but I do not think that genus is sufficiently distinct from *Macronema*.

MACRONEMA ERICHSONI, sp. nov.

TYPE.—M. C. Z. 10,902. French Guiana: Nouveau Chantier, June (Le Moul't).

Black; palpi, pronotum, and most of legs pale yellowish, the front tibiae and the tips of the others blackish. Fore wings mostly black; two subbasal streaks, an upper median spot, a transverse band before stigma, and two elongate spots in the lower apical part of wing are hyaline. Hind wings with dark veins; the tip, a small costal spot, and extreme base dark. Wings moderately slender, the discal cell of good size, as long as broad; the median cell rather small, three times as long as broad, its tip not beyond tip of discal cell; first fork with short pedicel. In the hind wings the radius runs into the first sector, and the cross-vein is at base of the fourth fork.

Expanse 22 mm.

PODOMACRONEMA, gen. nov.

Related to *Plectromacronema*, but the spurs are 2, 4, 4, and the front leg (in male at least) has the tibia and basitarsus broad and flattened, as is seen in the middle legs of other genera. Head much swollen in front, vertex with triangular plate hardly as prominent as in *Plectromacronema*; maxillary palpi slender, second joint much longer than the third or fourth which are subequal. Venation much as in *Plectromacronema*, and the outer side of the fore wing excised near middle.

TYPE.—*P. subfuscum*, sp. nov.

PODOMACRONEMA SUBFUSCUM, sp. nov.

TYPE.—M. C. Z. 10,904. Argentina—Misiones, 1909 (Jorgensen).

Yellowish brown; head more yellow, the swollen face brown; antennae yellow, the joints narrowly dark at tip; thorax dark brown, abdomen yellow brown, darker at tip; legs pale, front femora rather dark, front tibia and basitarsus with a dark band. Fore wings brown, some pale patches in the costal area; a long, hyaline streak behind the radius, several small spots near the anastomosis, and five silvery marks in apical region; an oblique, curved mark over basal parts of second and third apical cells, a small spot beyond of fourth apical cell, two narrow bands from the costa, the outer one the longer, and parallel to outer margin, and a fainter streak in the first subapical cell. Hind wings brownish, darker on tip and along the cubitus. The first sector unites for a short distance with the radius and then separates.

Expanse 34 mm.

LEPTONEMA NORMALIS, sp. nov.

TYPE.—M. C. Z. 10,891. Kamerun: Ja River (Bitze).

Pale yellowish, with yellowish hair; antennae more brownish; spurs brownish. Wings with fine yellowish hair, unmarked. Maxillary palpi long, second joint one and one half times third, fourth nearly as long as second. Wings have the subcosta running into radius in both pairs, other venation very similar to *L. occidentale*, but the median cell is shorter, and the cross-vein behind this is nearer to base of the fourth fork than to base of median cell; in hind wings the vein between third and fifth forks arises from a transverse cross-vein.

Expanse 25–26 mm.

Differs from *L. occidentale* in much paler color and the ending of subcosta in fore wings.

HYDROPSYCHE LONGIPALPIS, sp. nov.

TYPE.—M. C. Z. 10,894. Madagascar: Tananarive (Chulliat).

Pale brown, clothed with yellowish or golden hair; antennae pale, above with tips and bases of joints broadly dark; legs pale, tarsi more reddish; fore wings densely clothed with short, fine golden hair, without marks; hind wings infuscated near tip. Palpi extremely long, the fifth joint much longer than the others together, fully as long as the middle tibia; venation of typical *Hydropsyche*; discal cell nearly twice as long as broad, more than one half as long as median cell; first fork with a pedicel one half its length, third fork with a short pedicel; in hind wings first fork very small, but distinct, second fork reaches back almost to cross-vein back of discal cell, third fork shorter than the second.

Expanse 24 mm.

HYDROPSYCHODES PALLIDA, sp. nov.

TYPE.—M. C. Z. 10,897. Madagascar: Tananarive (Chulliat).

Yellowish brown, clothed with yellowish hair; antennae pale, scarcely annulate with dark at tips of the joints; wings pale yellowish gray, with yellow hair and some black hair in places, but not forming markings except on apical part where there are several black spots on the costa faintly continued back for a short distance as bands. Palpi moderately long, fifth joint as long as others together; wings with typical *Hydropsyche* venation, except that there is no first fork in hind wings. In the fore wings the first fork has a

pedicel nearly one half of its length, third fork very short pedicellate; discal cell fully three times as long as broad, median cell over one and one half times as long as the discal cell.

Expanse 17 mm.

HYDROMANICUS EXTREMUS, sp. nov.

TYPE.—M. C. Z. 10,888. Borneo: Telang (Grabowsky).

Dark; clothed with yellowish hair, on head and thorax mostly golden yellow; antennae pale yellowish, not annulate. Fore wings with yellowish hair, densely marmorate with pale brown, the largest mark is one near costa before stigma; hind wings faintly fumose near tip, the veins brownish. In fore wings the discal cell is of moderate length, about one half of third sector; first fork with a pedicel one half of fork, second fork reaches discal cell, third fork with a pedicel more than one half of fork, end of median cell is as far out as end of discal cell. In the hind wings the curvature of the subcosta and radius is extreme, so that in bending back they touch the discal cell, the radius apparently uniting with the radial sector for a short distance, and before that the radius and subcosta are almost united for a long distance.

Expanse 12–13 mm.

The smallest described species.

PLECTROCNEMIA FURCATA, sp. nov.

TYPE.—M. C. Z. 10,913. India: Lebong.

Yellowish brown, clothed with yellowish and brown hair. Antennae pale yellow, palpi more brown; pronotum yellow, rest of thorax brown, legs brownish. Wings pale brownish, with golden and blackish hair, stigma long, dark brown, several cross-veins in part whitish hyaline; in hind wings stigma also dark. Discal cell longer than pedicel, first fork as long as its pedicel, third fork short pedicellate; in hind wings the discal cell is very short and closed. The lower appendages of the male genitalia are long, slender, upcurved, the reddish chitinous pieces each side of the superior median plate are deeply furcate, each branch slender; acuminate, the inner branch strongly bent downward.

Expanse 19 mm.

SMICRIDEA AEQUALIS, sp. nov.

TYPE.—M. C. Z. 10,911. British Guiana: Bartica, December (H. S. Parish).

Black, with black hair, some white hair above the antennae in front; antennae yellowish brown; front legs mostly pale, middle legs dark on femora,

tibiae and tarsi wholly pale, hind legs dark, tarsi pale. Wings black, with black hair, a narrow, white, interrupted band from near stigma to arculus. Hind wings densely black-haired. In general similar to *S. nigripennis*, but the lateral male appendages as well as the superior median piece are much shorter.

Expanse 9 mm.

SMICRIDEA NIGRIPENNIS, sp. nov.

TYPE.—M. C. Z. 10,912. Colombia: Caldras, Cali (H. Fassl).

Black, with mostly black hair, a patch of short, appressed white hair just above and between the antennae; tips of palpi pale, legs black, middle tibia white on the outer base, and these tarsi wholly pale whitish, front legs mostly yellowish. Wings deep black, black haired, a curved, white band from stigma, reaching nearly across wing, and another before middle from costa also reaching nearly across; apical fringe white, outer angle and elsewhere black; hind wings black. Venation as usual, end of discal cell is continuous with end of median. Lateral appendages of male genitalia very long and slender, the basal segment clavate.

Expanse 8 to 9 mm.

SMICRIDEA MACULATA, sp. nov.

TYPE.—M. C. Z. 10,910. Brazil (Winthem coll.).

Black; head and thorax mostly clothed with short rufous hair; antennae dark brown; legs yellow brown, tarsi rather darker. Wings brown, almost black at apex; on the cubitus just beyond anal cell is a white spot, and several white spots from stigma to arculus almost forming a band; fringe at extreme apex of wing white, elsewhere brown; hind wings densely clothed with dark brown hairs, and long brown fringe. Male genitalia shows the last part of the lateral appendage enlarged at tip; the superior median plate only slightly wider in middle than at the bilobed tip.

Expanse 15 mm.

Related to *S. albosignata*, but much larger, and the appendages different. It is the *Chimarrha* (?) *maculata* of Hagen's South American list.

CHIMARRHA PUMILA, sp. nov.

TYPE.—M. C. Z. 10,908 Ecuador: Quevado (F. Rosenberg).

Brown; head with some brown hair, but most of that in front and behind is yellowish or grayish; antennae and palpi brown, latter with second and third

joints long, subequal, fourth much shorter, fifth as long as third, slender; legs pale, especially the femora, darker on tarsi, spurs nearly black. Wings faintly brown, with few brown hairs; venation much as in *C. bidens*, but the radial sector near base of discal cell is more strongly bent and in a longer curve; the median cell is longer than discal, and the first fork is broad at base on discal cell. In the hind wings the discal cell is much more slender than in *C. bidens*, and the first and second forks reach back farther on the cell. In the female the seventh ventral segment is slightly prolonged in the middle.

Expanse 8 mm.

CHIMARRHA PERSIMILIS, sp. nov.

TYPE.—M. C. Z. 10,907. Ecuador: Quevado (F. Rosenberg).

Yellowish brown, clothed with yellowish and gray hair; hair of head very dense and erect, yellowish, behind on vertex nearly black; male palpi dark, large and heavy, second and third joints subequal, as long as the fifth, fourth about one half as long as fifth. Tips of abdominal segments pale. Wings pale brownish, clothed with yellowish hair, venation as in *C. consimilis* and *C. immaculata*, but third fork has a longer pedicel. The male genitalia have the lower appendages long and tapering, the median piece as in *C. immaculata*, the superior appendages slender, upcurved; seen from above there is no spined plate as in *C. immaculata*.

Expanse 12 mm.

Closely allied to *C. consimilis* of Peru and *C. immaculata* of Bolivia, and these are probably the sexes of one species. The male genitalia separates it from the latter; the dark hair on head, and shorter third fork from the former.

CHIMARRHA TEXANA, sp. nov.

TYPE.—M. C. Z. 10,914. Texas: San Antonio, August (F. H. Snow).

Black; head with brown hair; antennae, legs and spurs brown; wings brown, with some black hair, a large spot of yellowish white hair behind stigma, reaching one half way across wing, a narrow band of similar hairs over the base of fourth fork to the arculus, and a broad streak in the basal part of wing. Palpi with the third joint no longer than the second, neither longer than the fifth, fourth swollen below, rather more than one half of the fifth. Wings with discal cell and the radial sector at its base not modified; third fork longer than its pedicel; discal cell reaches back to base of median cell; venation brown, anastomosis, veinlet at base of median cell, and the arculus hyaline white.

Expanse 15 to 16 mm.

PROTODIPSEUDOPSIS BICINCTA, sp. nov.

TYPE.—M. C. Z. 10,893. Kamerun: Ja River, Bitze.

Head black, with some yellow hair; palpi and antennae yellow, latter with scattered black hair, thorax and abdomen dark brown; pronotum with black hair; legs pale yellowish. Wings dark brown, clothed with fine golden hair and much longer black hair; fore wings with a pale band just beyond the anastomosis, and an oblique band, wider behind, just before bases of discal and median cells, both clothed with dull yellowish hair, and not as prominent as in *P. sjostedti*; veins dark, the lower anastomosis and the thyridium hyaline white; hind wings dark in front, paler behind and at base, veins dark, the cross-vein at base of fifth fork is margined with white. Fore wings rather longer in apical part than in *P. sjostedti*; venation much as in that species; in fore wings third fork has a shorter pedicel; in hind wings the second fork reaches the discal cell.

Expanse 26 mm.

DIPSEUDOPSIS CURVATA, sp. nov.

TYPE.—M. C. Z. 10,896. Madagascar: Tananarive (Chulliat).

A large brown species without marks in the male. Antennae and legs yellowish brown; palpi black; tips of tibiae black; segments of abdomen marked with black on sides. Fore wings yellowish brown, veins brown, the cross-vein at base of median cell and the arcus hyaline white; hind wings faintly fumose, veins yellowish brown; the female has paler wings, almost gray, the cubitus and its lower branch deep brown, and the cross-vein to first anal marked with brown, a short, dark streak on radius near the base, and the anastomosis brown. Maxillary palpi with third joint a little longer than the second, fourth scarcely as long as second, much thinner; inner spur of hind tibia not much longer than other, near its tip it is curved and twisted into an acuminate spine. Fore wings slender, tip elongate, nearly acute. Venation similar to *D. immaculata*, the discal cell rather shorter, first fork distinct, third fork twice its pedicel; in hind wings fifth fork is wider than in *D. immaculata*.

Expanse ♂ 32 mm.; ♀ 37 mm.

DIPSEUDOPSIS ELONGATA, sp. nov.

TYPE.—M. C. Z. 10,882. Borneo: Sandakan (C. F. Baker).

Black; posterior margin of vertex reddish; abdomen brown, the segments paler on tips; legs dull yellowish. Wings blackish, darkest near stigma; hairs and veins black; a small pale spot behind fourth fork, and a large, elongate, pale spot from tip of anal veins back along anal margin, a hyaline dot on

the thyridium; venation very similar to *D. nervosa*, the inner spur of hind tibia is very long, more than one half as long as hind tibia, more than twice as long as the outer spur; the tip is enlarged foot-like, the edge with fine erect hair, the claw bent around one end. The male genitalia show a rounded lobe each side.

Expanse 35 mm.

GUNUNGIELLA NIETNERI, sp. nov.

TYPE.—M. C. Z. 10,917. Ceylon (Nietner, Hagen coll.).

Head and thorax yellowish, with some golden and some brownish hair; maxillary palpi dark, very long as in *G. reducta*. Antennae wholly pale; head high above eyes; the posterior warts large, yellow. Abdomen dark brown; legs yellowish brown, the hind tibiae with a fringe of long hair on the outer side. Wings brown, the fore wings with fine mostly golden hair, and brown fringe, a whitish hyaline dot on thyridium, on anastomosis and transverse line over anastomosis; hind wings darker than fore wings, with mostly black fringe. Venation similar to *G. reducta*, but in the fore wing the fifth fork is much broader, each side more rounded, and in the hind wings the second fork is almost twice as long as in that species, and the fifth fork is very broad as in the fore wings.

Expanse 10 mm.

RHYACOPHILIDAE.

APSILOCHOREMA DIFFINIS, sp. nov.

TYPE.—M. C. Z. 10,918. Ceylon (Nietner, Hagen coll.).

Brown, clothed with yellowish and brown hair, that on head and thorax mostly yellow; palpi brown; antennae pale on base, gradually darker beyond; legs yellowish brown, the tibia paler at insertion of spurs; fore wings with erect brown and yellow hair, mostly brown, two streaks of black hair near middle, in apical part with appressed brown and pale yellowish hair; fringe brown, darkest at apex; hind wings gray, fringe and veins brown. Venation in general similar to *A. indicum*, but the false cell near the middle of wing has the outer side much more oblique, third fork shorter; in the hind wings the third fork is much shorter than the second. In the male genitalia the lower appendages are widest near the middle, and seen from above have a large, curved tooth toward inner tip.

Expanse 12 to 14 mm.

PLATE 1.

- Fig. 1. *Psocus sticticus*, fore wing.
- Fig. 2. *Psocus memorialis*, fore wing.
- Fig. 3. *Macronema subaequalis*, maxillary palpus.
- Fig. 4. *Podopteroecus longicornis*, fore wing and hind tibia.
- Fig. 5. *Limnephilus morrisoni*, top of female genitalia.
- Fig. 6. *Caecilius reductus*, fore wing.
- Fig. 7. *Psocus coquilletti*, fore wing.
- Fig. 8. *Psocus hermosus*, fore wing.
- Fig. 9. *Acroneuria manchuriana*, side of male genitalia.
- Fig. 10. *Allopsocus marginalis*, wings.
- Fig. 11. *Allopsocus marginalis*, head and antenna, above.
- Fig. 12. *Anisogamus edwardsi*, male genitalia side view.
- Fig. 13. *Dipseudopsis elongata*, spur of hind tibia.

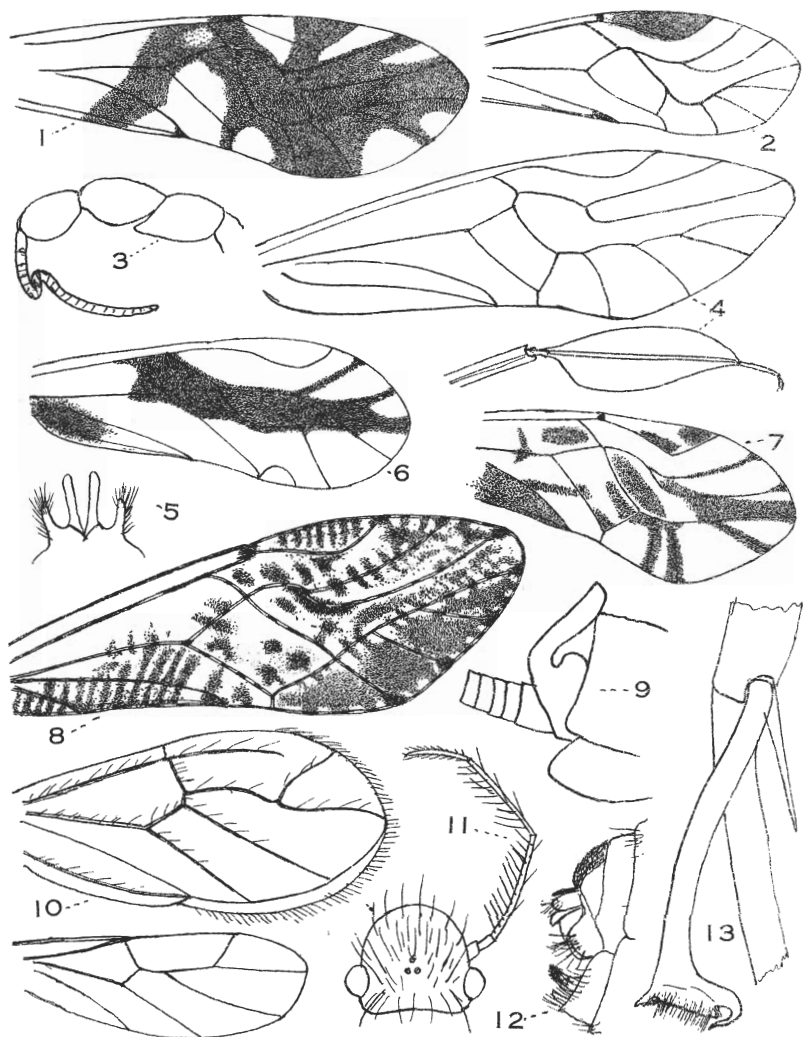


PLATE 2.

- Fig. 14. *Psocus viscayana*, fore wing.
- Fig. 15. *Psocus interruptus*, fore wing.
- Fig. 16. *Podomacronema subfuscum*, front leg.
- Fig. 17. *Psocus pulchellus*, fore wing.
- Fig. 18. *Psocus borneensis*, stigma of fore wing and antenna.
- Fig. 19. *Psocus aztecus* fore wing.
- Fig. 20. *Podomacronema subfuscum*, fore wing.
- Fig. 21. *Apsilochorema diffinis*, male genitalia top view.
- Fig. 22. *Hydropsyche longipalpis*, male genitalia side view.
- Fig. 23. *Kathroperla perdita*, head and pronotum.
- Fig. 24. *Dinopsocus semicoloratus*, fore wing and antenna.

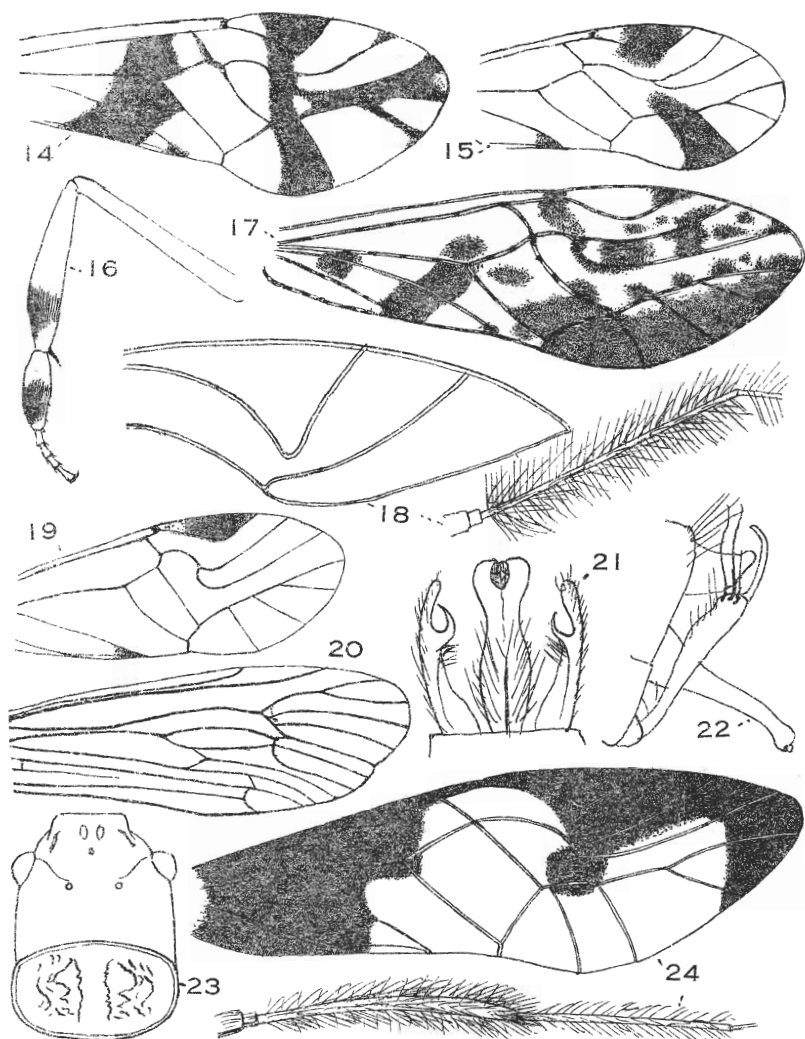


PLATE 3.

- Fig. 25. *Dinopsocus atratus*, fore wing and antenna.
- Fig. 26. *Raphidia bifurca*, superior plate, male genitalia.
- Fig. 27. *Leptocella gemma*, superior appendage male genitalia.
- Fig. 28. *Psocus parishi*, fore wing.
- Fig. 29. *Psocus elegantula*, fore wing.
- Fig. 30. *Hydromanicus extremus*, hind wing.
- Fig. 31. *Epipsocus pictus*, fore wing.
- Fig. 32. *Limnephilus morrisoni*, top, male genitalia.
- Fig. 33. *Psocus lepidus*, fore wing.
- Fig. 34. *Psocus quadrisignatus*, fore wing.
- Fig. 35. *Magellomyia moesta*, top, male genitalia.
- Fig. 36. *Zachobiella punctata*, fore wing.

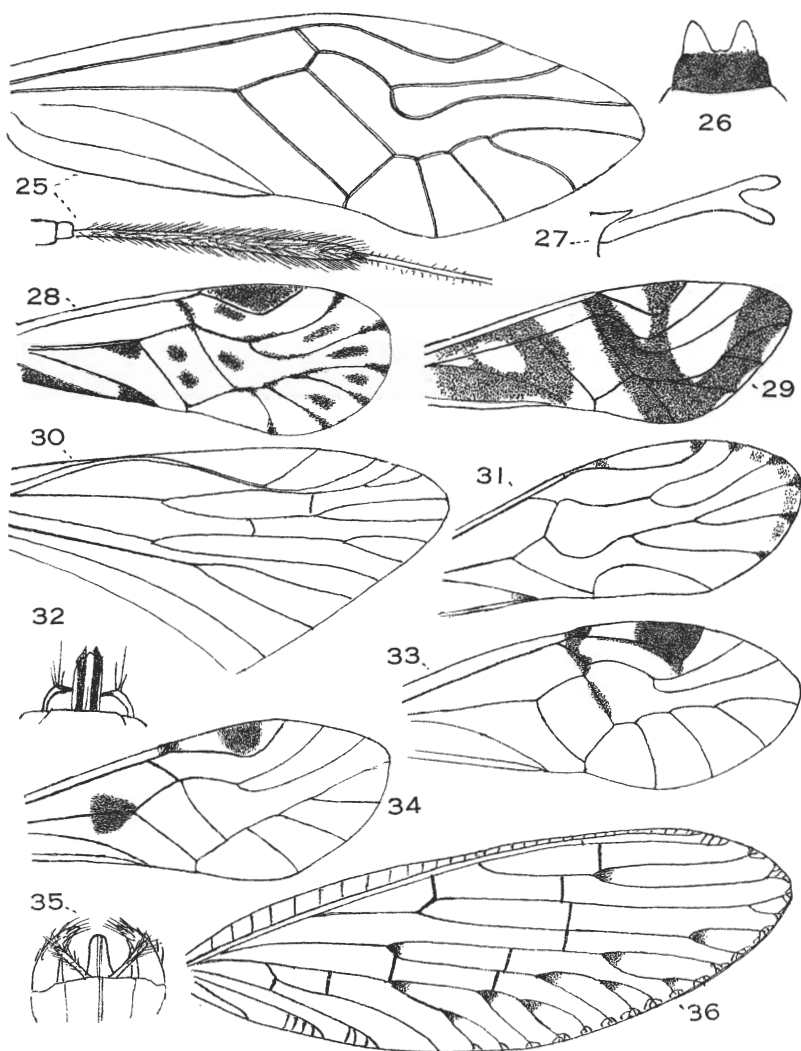


PLATE 4.

- Fig. 37. *Perla expansa*, female, ventral plate.
- Fig. 38. *Perla subvarians*, female, ventral plate.
- Fig. 39. *Nemoura javanica*, male genitalia from below.
- Fig. 40. *Isoperla mormona*, female, ventral plate.
- Fig. 41. *Perla verticalis*, female, ventral plate.
- Fig. 42. *Perla incesta*, female, ventral plate.
- Fig. 43. *Alloperla fidelis*, female, ventral plate.
- Fig. 44. *Perla anamensis*, female, ventral plate.
- Fig. 45. *Leuctra malayana*, male genitalia from below.
- Fig. 46. *Perla repanda*, base of fore wing.
- Fig. 47. *Perla repanda*, male, genitalia from below.
- Fig. 48. *Kathroperla perdita*, female, ventral plate.
- Fig. 49. *Oyamia nigripennis*, female, ventral plate.
- Fig. 50. *Oyamia nigripennis*, male genitalia from above.
- Fig. 51. *Perla carletoni*, female, ventral plate.

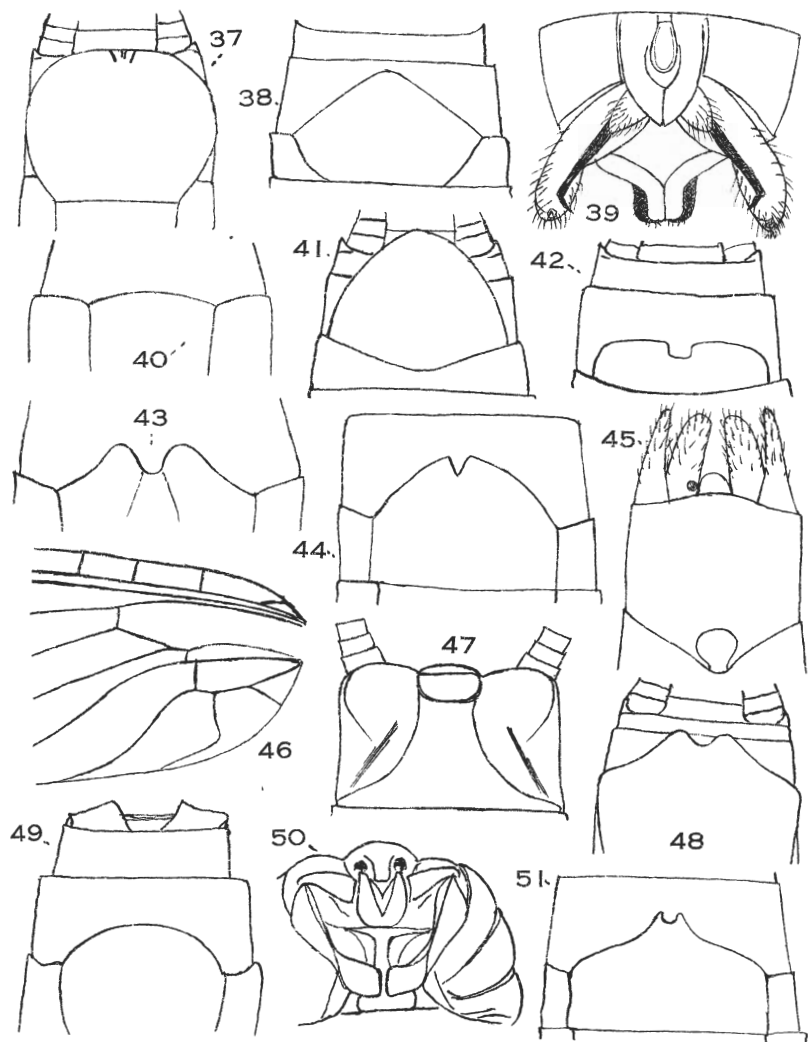


PLATE 5.

- Fig. 52. *Dipseudopsis curvata*, spurs of hind tibia.
- Fig. 53. *Leptocella separata*, male genitalia side view.
- Fig. 54. *Isoperla isolata*, female, ventral plate.
- Fig. 55. *Plectrocnemia furcata*, male genitalia top view.
- Fig. 56. *Smicridea nigripennis*, male genitalia top view.
- Fig. 57. *Anabolia curta*, male genitalia side view.
- Fig. 58. *Smicridea aequalis*, male genitalia top view.
- Fig. 59. *Chimarra persimilis*, male genitalia side view.
- Fig. 60. *Perla nirvana*, female, ventral plate.
- Fig. 61. *Nemoura stylata*, male genitalia from below.
- Fig. 62. *Macronema erichsoni*, fore wing.
- Fig. 63. *Anisogamus edwardsi*, female appendages top view.
- Fig. 64. *Acroneuria manchuriana*, male, genitalia top view.
- Fig. 65. *Plectrocnemia furcata*, male genitalia side view.
- Fig. 66. *Smicridea maculata*, male genitalia side view.
- Fig. 67. *Phylloicus lituratus*, male genitalia from above.
- Fig. 68. *Perla duplicata*, male genitalia from below.
- Fig. 69. *Limnephilus kennicotti*, male genitalia top.
- Fig. 70. *Neoperla remota*, female, ventral plate.
- Fig. 71. *Acroneuria manchuriana*, female, ventral plate.

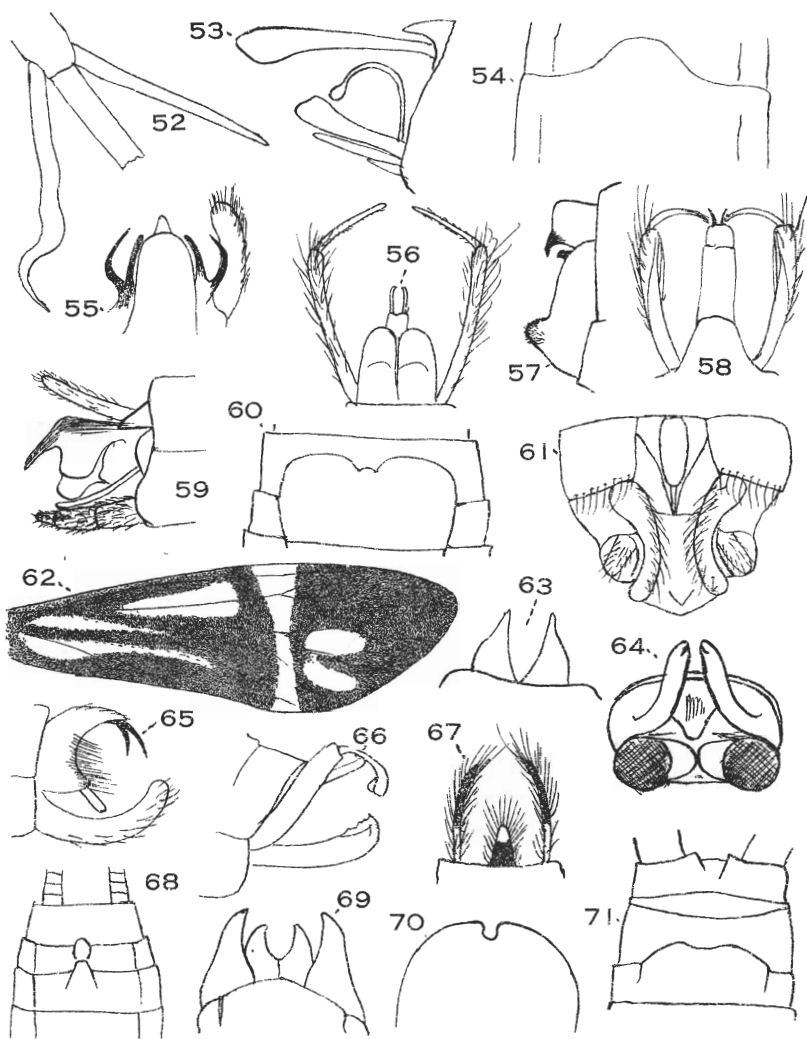


PLATE 6.

- Fig. 72. *Aethaloptera dyakana*, fore wing.
- Fig. 73. *Amphipsyche parva*, fore wing.
- Fig. 74. *Podomacronema subfuscum*, male, genitalia side.
- Fig. 75. *Mantispa verticalis*, head and pronotum.
- Fig. 76. *Hemerobius tagalicus*, male genitalia side view.
- Fig. 77. *Notiobiella valida*, male, part of fore wing, genitalia.
- Fig. 78. *Magellomyia moesta*, fore wing.
- Fig. 79. *Peripsocus pumilus*, fore wing.
- Fig. 80. *Magellomyia moesta*, male, palpi and genitalia.
- Fig. 81. *Goera octospina*, male genitalia above, and margin of sixth ventral segment.
- Fig. 82. *Phylloicus lituratus*, male genitalia side view.
- Fig. 83. *Paranotoperla thoreyi*, male genitalia top view.
- Fig. 84. *Leptocella diminuta*, male genitalia side view.
- Fig. 85. *Paranotoperla thoreyi*, fore wing.
- Fig. 86. *Nemoura javanica*, male genitalia side view.

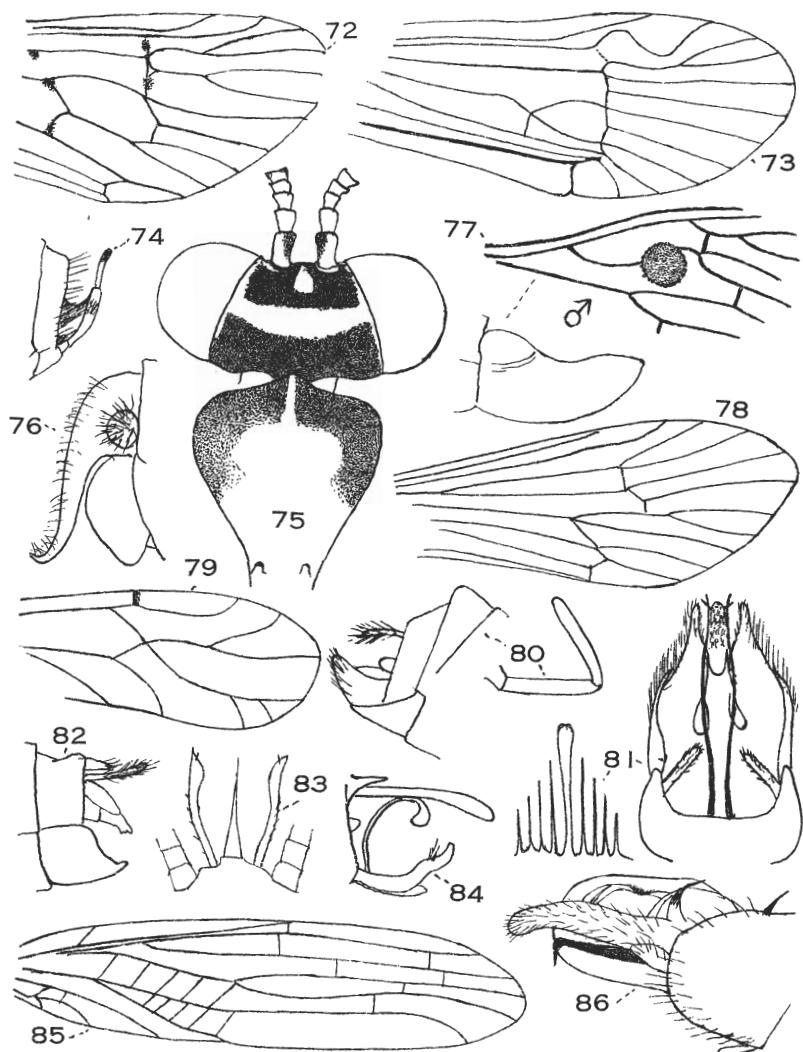


PLATE 7.

- Fig. 87. *Smicridea nigripennis*, male genitalia side view.
- Fig. 88. *Limnephilus kennicotti*, male genitalia side view.
- Fig. 89. *Hydropsyche pallida*, male genitalia side view.
- Fig. 90. *Apsilochorema diffinis*, male genitalia side view.
- Fig. 91. *Limnephilus crassus*, male appendages from above.
- Fig. 92. *Limnephilus elongatus*, male genitalia side view.
- Fig. 93. *Limnephilus adustus*, male genitalia side view.
- Fig. 94. *Limnephilus elongatus*, female appendages from below.
- Fig. 95. *Limnephilus crassus*, male genitalia side view.
- Fig. 96. *Limnephilus morrisoni*, male genitalia side view.
- Fig. 97. *Helicopsyche*, ventral spine, *a*, of *H. muelleri*, *b*, of *H. peruana*.
- Fig. 98. *Limnephilus elongatus*, male genitalia from below.
- Fig. 99. *Limnephilus elongatus*, female appendages from above.
- Fig. 100. *Oecetina disjuncta*, male genitalia side view.
- Fig. 101. *Ecclisomyia simulata*, male genitalia from below.
- Fig. 102. *Anisogamus edwardsi*, male genitalia from above.
- Fig. 103. *Leptocerus modestus*, male genitalia from below.
- Fig. 104. *Colpotaulius tarsalis*, male genitalia from below.
- Fig. 105. *Zaporota pallens*, male, maxillary palpus and genitalia from side.
- Fig. 106. *Ecclisomyia simulata*, male genitalia side view.
- Fig. 107. *Algonquina chilensis*, male genitalia side view.
- Fig. 108. *Leptonema normalis*, male genitalia from above.
- Fig. 109. *Hemerobius rizali*, male genitalia side view.
- Fig. 110. *Ironoquia australis*, male genitalia side view.

